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THE

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THE

Dental Office and Laboratory.

THIRD SERIES.

Vol. I. PHILADELPHIA, JANUARY, 1887. No. 1.

WE MAKE OUR BOW IN OUR NEW DRESS.

We propose to change the "Dental Office and Laboratory" in form only for the present, and to abandon its form from the *old* size to its *new*. Many dentists have complained that its former shape was ill suited to the library or book shelves, while for ordinary perusal it was unhandy and cumbersome; hence many valuable contributions were lost and could not be kept for future reference. We trust its new form will overcome both of these drawbacks.

It will be the aim of its publishers to lay before its readers and patrons all that is going on in the world of dentistry, and in this they solicit the co-operation of all members of the dental profession.

They solicit original communications on all articles of practical interest, and for these they will pay at the rate of two dollars per printed page, if used.

This journal will be mailed to all subscribers at $1 per annum, payable in advance.

The transactions of societies, reports, papers, letters from abroad relating to dentistry, translations, etc., are kindly solicited for publication.

The names of local societies, with the addresses of their officers, will be published gratis, and the same kept before the profession.

Wants and For Sales, if not exceeding thirty words, will be inserted free.

Cases of irregularity with the appliances used for their correction, as well as all instruments, conveniences, appliances, etc., etc., will be illustrated, for the better understanding of the subjects to which they relate.

"The Practical Place," so long and favorably received in our old issue, will be continued in this quarterly review.

We likewise propose to publish a series of practical articles on dental mechanism, as well as on all subjects of practical interest in operative dentistry. These articles will contain all that is new in both these branches, but may be of more interest to the student than to the old practitioner; so that while we may be going over the beaten track, some lessons or hints, perhaps, may be learned or made available to all.

This quarterly will not confine itself *only* to articles pertaining to dentistry, but extracts of papers of interest from medical or scientific journals will find space in its columns.

VULCANITE WORK.

TAKING IMPRESSIONS OF THE MOUTH—BY DR THEO. F. CHUPEIN.

The patient being seated in the operating chair, the first effort will be the examination of the mouth; to ascertain where the hard and soft places are located. It will generally be found that along the ridge, from the heel of the jaw, or maxilary tuberosity, for about an inch to an inch and a half on each side, running forward will be hard. This hard surface will be generally about one-eighth to three-sixteenths of an inch in width. Along the median line there will likewise be found a hard surface extending backward from the rugae to the soft palate, more or less wide and varying in shape. These are generally the hard places. The soft places are found between the ridge and the median line, on each side, and the forward part of the ridge in the space generally occupied by the eight front teeth, viz., the four incisors, two cuspids, and two bicuspids. To make what we have described perfectly clear and comprehensible to the student, we have prepared a cut of a mouth having such hard and soft places which we have delineated. Fig. 1.

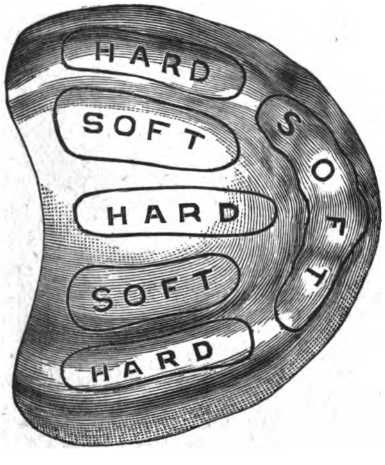

FIG. 1.

The mouth being examined, the next thing will be the selection of a proper sized and shaped impression cup. The impression cup should be somewhat larger than the gum it is to enclose. It should be about one-quarter inch wider and longer than the mouth; that is, one-eighth of an inch to spare on each buccal surface, one-eighth of an inch to spare in front or on the labial surface, and about one-eighth of an inch beyond the hard palate.

There are some operators

who give the preference to clean, fresh yellow beeswax to take impressions of the mouth; others to modelling composition. If the former be used it is softened in warm water of the temperrture of 130° Fah. If modelling composition, nearly boiling water may be used to soften it. When either of these is softened, it is placed in the impression cup, which is warmed, to make it adhere to the cup. The cup is filled to the level of its rim. Too much impression material should not be used in the cup, as the excess is apt to curl or crowd over on to the soft palate, and produce nausea. Should the mouth have a deep or high arch, the impression material, when being put into the cup, may be pinched into an elevation, so as to be sure that this part of the mouth is well reached and impressed by the material.

The material being put into the cup, it is carried into the mouth. The operating chair should be a little lowered, so that the operator may stand behind and over the patient. The cup is introduced into the mouth holding it by the handle, when it is seized with the thumb and fingers of both hands, on each side, after it is introduced into the mouth, and brought into position, and the material pressed steadily up against the gum, the head of the patient resting against the chest of the operator; the back part of the cup near the boundary of the hard palate, being pressed against this part of the gum first. The cup may now be held firmly in position with the fingers of the left hand, *not permitting it to move from its place*, while with the forefinger of the right hand insinuated into the mouth under the lips, the material is pressed against the buccal and labial borders of the alveolar ridge covered by the gum. This being done the cup is held immovably in place until the material hardens, so that it may not be bent or twisted out of shape in taking it out of the mouth. The chilling or hardening of the impression material may be hastened by throwing a jet of cold, or iced water all over the impression cup while in the patient's mouth, by means of a dental syringe. It is thought that a good impression, of any material, will adhere to the gum when the mouth is edentulous, and will require some force to remove it. Should it adhere too tightly it may be loosened by holding back the lips to permit the air to pass between it and the gums, and throwing a jet of water between the lips and the impression, when it will either fall from its position or be easily removed. Should it not do so, a slight cough on the part of the patient, will usually effect its separation from the gum.

Of all the materials for taking impressions of the mouth, it is now almost universally conceded that plaster of Paris is the most reliable. To take an impression with this material, plaster of Paris is prepared and sold at the dental depots as "impression plaster." It differs only from model plaster, in being prepared to set rapidly, so that the disagreeable operation of an impression with plaster is reduced to the shortest space of time possible. Many operators use model plaster, to which a little common table salt is added, for the purpose of inducing rapid setting. A cup for a plaster impression should have its posterior edge turned upward toward the soft palate, to prevent, as much as possible, the plaster from flowing over on to the tongue or fauces, and thus to rob the operation of some of its disagreements (see Fig. 3.) This part of the cup, however, may be improvised by sticking to it, at this part, a piece of base wax, and bending this upward, which serves admirably to retain the plaster, and to prevent the overflow. The cup being filled up to the rim with plaster, and made smooth with the spatula, it is introduced into the mouth quickly, one side at a time (pushing out the cheek on one side the better to introduce the entire cup, when the orifice of the mouth is small), and when in the mouth it is brought to the centre, the handle of the cup being held between the forefinger and thumb of the right hand, the other fingers resting against the palatine portion of the cup. It is then pressed upward, the back part of the plaster in the cup being brought in contact with this part of the gum first, and afterward on to the forward parts of the gums. Should the plaster incline to set quickly before the cup is brought into position, the fingers of the left hand may be quickly brought to the palatine surface of the cup to hold it steadily, while the forefinger of the right hand may be used to press or mat the plaster against the buccal and labial surfaces of the gums. The plaster in the impression cup is held steadily and immovably in position until it sets hard enough to break with a sharp, clean fracture. This is determined by what remains in the bowl, where it had been mixed with water. To be a good impression, it should adhere to the gum with some force. If it adhere too firmly it may be loosened by holding back the lips and throwing a jet of water from the dental syringe on to it next to the gums, or a slight cough on the part of the patient will generally loosen it. If the arch should be *moderately* high—too high for the impression cup to touch—it is a good plan, before introducing the impression cup filled with plaster as described, to daub all over the palatine surface of the gum some of the plaster from the bowl, with a spatula—and *then* introduce the cup. But if the arch is *very deep* or high, it is best first to take an impression with modelling composition, and when hard remove from the mouth and chill thoroughly. Then dress away all superfluous material, cutting away about one-eighth of an inch from the inner surface of this impression on all surfaces where it is thought the plate is likely to rest. A small quantity of plaster is now mixed and put into the space thus carved out of this impression, when it is re-introduced into the mouth, and pressed into place as before described.

NAUSEA.

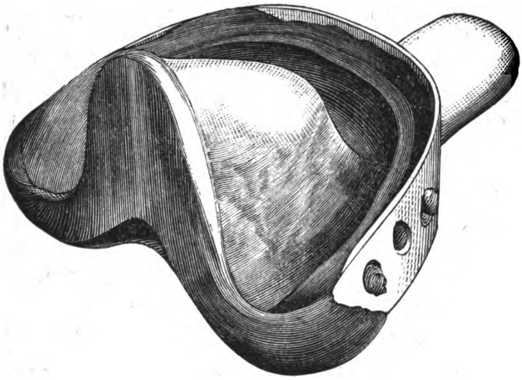

FIG. 2
Represents a modelling compound impression prepared as described.

It sometimes happens that persons are so sensitive about the mouth that they cannot bear any thing to touch the gums, and others that the slightest approach to, or encroachment on the soft palate, produces a nausea and retching that is painful in the extreme. Such mouths have to be educated, as it is said, until an impression can be taken.

There is apparently something excessively nauseating to such persons when plaster of Paris is used for an impression material. Some of them seem to be able to put up (after education) with a wax or modelling compound impression, but plaster of Paris gags them beyond endurance. It is said that even for such as these, this idiosyncrasy may be entirely overcome, by painting the mucus membranes of the mouth, and particularly that about the posterior edge of the hard palate, and the anterior edge of the soft, with a 4 per cent. solution of hyra-chlorate of cocaine on a camel-hair pencil.

An impression cup such as is illustrated below (Fig. 3) would be of the proper form to take an impression of a mouth, such as is illustrated at Fig. 1.

For larger mouths layer cups will be necessary.

The impression of the mouth taken with plaster is represented at Fig. 4.

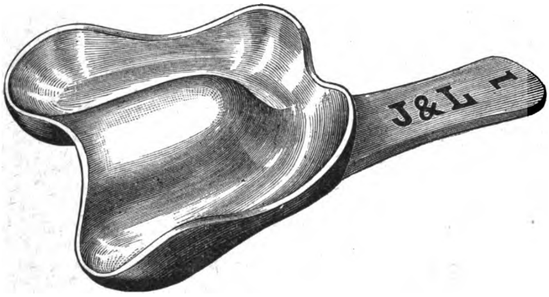

FIG. 3.

THE MODEL.

The impression being secured, the next step will be the construction of the model. For this purpose the plaster impression is painted

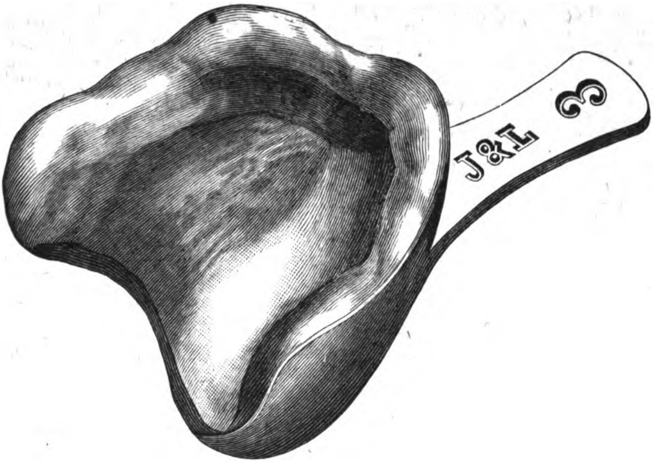

FIG. 4.

all over its surface with a thin coat of shellac varnish. When this has dried, another coat of thin sandarac varnish is applied to the same surface. This leaves the impression with a very smooth gloss, which is imparted to the model. Many operators object to the application of any varnish or oil to the impression, and fill the impression without any of these intermediary substances; but we have not found that the very thin film of these varnishes ever made any appreciable difference in the fit of a plate. Besides, with this preparation, the impression is parted from the model with much greater facility. There is no need to use oil or any parting compound on a plaster impression for the sake of parting it from the model; by simply placing it in a bowl of clean water and let it soak, while you mix your plaster in another bowl to make the model, there need be no fear of the two adhering.

To make a model from an impression taken and prepared as described, a sufficient quantity of water is put into a bowl and fine model plaster is sifted and put into it. It is a bad plan to take the quantity of plaster in the bowl first and add the water to it. Such a procedure is apt to result in a model filled with air holes. While the plaster is evenly mixed and freed from all air bubbles by putting it to the water, the impression is removed from the bowl of water into which it had been put, inverted, and shaken, so as to remove all the water that may have adhered to it. The bowl containing the plaster should be struck or rapped on a table on its bottom, to disengage any air that might still remain in the plaster. The impression may be held by the handle of the cup, with the left hand, while the plaster is conveyed to it, with

FIG. 5.

a teaspoon or spatula (Fig. 5) in the right hand. The impression is filled by conveying the plaster first on one side, and tilting the cup so that the plaster will gradually and evenly flow all over the surface. This is made further necessary to prevent any air bubbles from being in the model, should the impression be filled from different points. When the whole surface of the impression is thus filled, it may be laid on a table on a piece of paper, and gradually built up to the desired height or thickness by the addition of plaster conveyed little by little with the spoon or spatula. For vulcanite work it is not necessary to build the model very high; a half inch above the highest point of the palatine arch is amply sufficient. A very good plan to make a model is to take a strip of paper two inches wide by twelve inches long and wrap or fold this evenly all around the outer rim of the impression in the cup, holding it close to this with the fingers of the left hand, and into the receptacle thus formed, conveying the plaster with the spoon in the right hand. When the plaster sets moderately, the paper may be unwound, leaving the model neatly made, and requiring but little after trimming. The model being thus made, and the plaster having set hard, it may generally be removed from the impression by striking it, or the model, a few raps with a small wooden mallet. If these should fail to part the two, it will be necessary to cut away the impression piece-meal, so as to remove it from the model. This must be done carefully, so as to avoid cutting or defacing the model with the knife.

Some operators use a coloring material with their impression plaster, so as to form a line of demarcation between the two. Although this is a safer plan, it is not absolutely necessary, as the varnish used for painting the impression sinks into this and serves as a guide in the removal or parting of the two. To remove a model from a wax impression it is simply necessary to place all in a bowl of hot water of 130° F. to soften the wax, when they are easily parted. For modelling compound the water is used hotter. The model being removed from the impression, a base plate is moulded on it by softening a half sheet of base plate wax, and pressing or moulding this with the fingers all over the face of the model. It is then cut to the proper size with a heated wax knife, (Fig. 6) and a rim of articulating wax laid on and secured to this base plate running from heel to heel, as represented by Fig. 7.

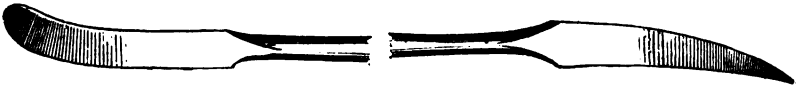

FIG. 6.

Some operators—and these the most careful—swedge up a plate for each case, whether for vulcanite or or for metal work, by making dies and counter dies for the purpose. For vulcanite work they use a plate of pure tin, which is easily swedged. By this they are sure of a fit before the whole of the work is completed, which would not be the case if this be not done. The base plate being made by either mode, is prepared with the articulating wax, as has been described, and is then placed in the patient's mouth to obtain what is termed

THE BITE.

When the base plate, with the articulating wax attached to it is placed in the patient's mouth, she should be directed to close the lower teeth *gently* against it. The lips should be brought over this wax nicely, and a close scrutiny made of the features. Should this articulating wax be found too full, so as to puff out or protrude the lips, it should be marked where the fullness exists, removed from the mouth, laid on the model, and cut away sufficiently so as to reduce the fullness. On the other hand, should it be found that the features are not fully restored to their proper fullness or contour by this articulating wax, it should be marked where the fullness is required, removed from the mouth, laid on the model, dried thoroughly of the saliva adhering to it, and more wax added at the point requiring the fullness. This articulating wax should likewise be cut to the proper length, so as to be a guide as to the length for the teeth that are to be supplied. For this purpose the patient should be engaged in conversation with the operator, made to talk, smile and laugh, so that he may observe the length of the articulating wax, and either add to or cut away from it, until it is of the proper length. This being all determined, the patient is directed to bite *slightly* into the articulating wax, only so much as to leave a slight indentation of the lower teeth into it. At Fig. 7 are seen the indentations left in the wax by the lower teeth. The median line is now marked on the articulating wax, and the base plate removed

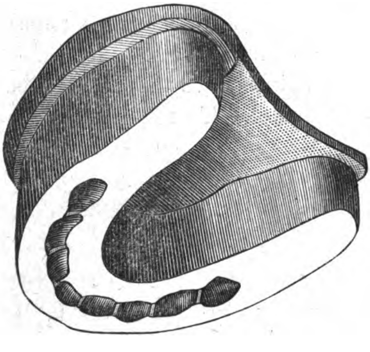

FIG. 7.

and laid on the model. Some wax is now softened and put into a lower impression cup and an impression taken of the lower teeth, from which a model is made. When this has set hard, it is immersed into a bowl of warm water to soften the wax, and the model of the lower teeth removed from this wax impression. The teeth of this lower model are now put into the indentations left on the articulating wax by the teeth of the patient, which it exactly fits.

Some operators do not go to this trouble, but it is by far the best and most intelligent way of working. The bite thus obtained is now fastened to the articulator (Fig. 8.)

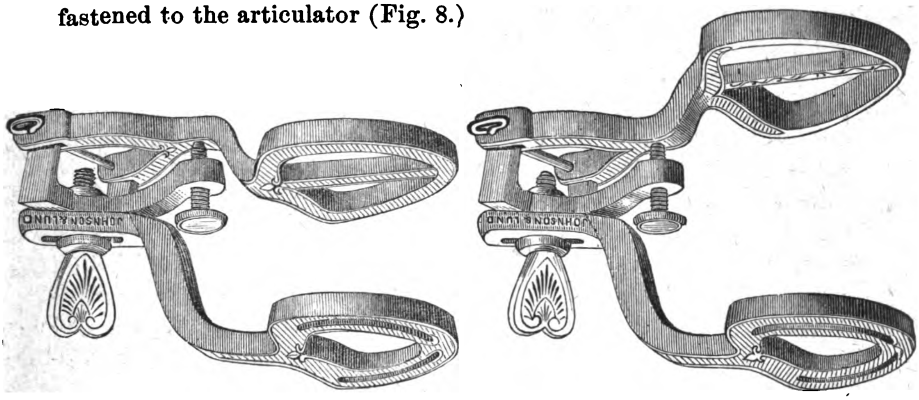

FIG. 8.

A word may be said in reference to this articulator. By inverting the upper part it will accommodate both thick or thin models, which is quite an advantage, as when thick models are used, as in gold-plate work. [TO BE CONTINUED.]

THE DIETETIC VALUE OF WATER.

BY GEO. B. FOWLER, M.D., N. Y.;
PROF. OF CLINICAL CHEMISTRY, N. Y. POLYCLYNIC; VISITING PHYSICIAN TO THE N. Y. INFANT ASYLUM, THE RANDALL'S ISLAND HOSPITALS, ETC.

Water is the essential element for the manifestation of physiological phenomena. Hoppe-Seyler very aptly says that all organisms are surrounded by running water.

I venture the statement that the cause of one-fourth the cases of disordered digestion in fashionable life is a lack of sufficient water in the dietary. It has become customary with men to substitute at their meals wines and liquors, and women, if they do not indulge in these, draw the line at a few sips of ice water, fearing, as they say, that water freely indulged in will produce obesity, or, by diluting the digestive fluids, induce dyspepsia. I am aware that such doctrines have been promulgated by high authorities, but am nevertheless firmly convinced that they are pernicious fallacies. It only needs a little common sense and observation to controvert them.

Who of us has not met with a case like this: A lady of thirty-five years, wealthy and worldly. When young, and a resident of the country, noted for her beauty of form and face. Now after ten years of city life, is wan and yellow. Her integument and muscles are shrunken and pasty; her eyes deep set and surrounded by dark rings of wrinkled skin. The prominent abdomen is the only relic of her former rotundity, now due, however, to flatulence and impacted feces.

You question her, and she relates a doleful story of weariness, anorexia, constipation, "nervousness," headaches and backaches, irregular and scanty menstruation, scalding urine, piles, flatulence, heartburn, palpitation, etc. She informs you still further, that she never drinks water, having been instructed to that effect by her former physician; that she voids a couple ounces of high colored urine about three times a day, and gets rid of a few masses of hardened feces, after an enema, twice a week.

Now I regard such an organism as this as surrounded not by running water, but by inspissated mucus. Of course various causes have brought about this mummyfied wreck, chief among them indigestion from lack of water. These are just the cases which respond so satisfactorily to the hot water treatment, or to a sojourn at a mineral spring. In either case the needful is supplied, and by proper guidance in other matters health is soon restored.

It may safely be said that water is the most important of all sub stances supplied as food. Animals and men survive upon it longer than upon any other single alimentary principle.

The importance of a full supply of this material is easily understood when we glance at the role it plays in the economy. In the first place, water constitutes 70 per cent. of the body weight, distributed as follows:

PERCENTAGE OF WATER IN

Teeth	10	Bile	88
Bones	13	Milk	89
Cartilage	55	Pancreatic juice	90
Muscles	75	Urine	94
Ligaments	76	Lymph	96
Brain	79	Gastric juice	97
Blood	80	Perspiration	98
Synovial fluid	81	Saliva	99

Water gives mobility to the fluids, dissolves and carries in solution the various substances intended for nutrition or destined for excretion. It supplies rotundity and flexibility to the body as a whole; strength and elasticity to the muscles, bones, legiments and cartilages; through its agency exchange of matter and tissue metabolism is effected. In short, I repeat, it is only by the presence of water in proper proportion in all the tissues and fluids of the body that the physiological phenomena which characterizes health can take place. Milk, the sole food of animals during a period of most active physiological changes, contains 85 per cent. of water.

A healthy adult excretes about 90 ounces of water per day, as follows:

Lungs	14 ounces.
Skin	26 “
Urine	50 “

That means that these proportions must be supplied in order that the vital processes may operate effectively and normally.

How is it done? Fifteen or twenty ounces are combined with the solid food, and therefore we must take as beverage each day seventy or seventy-five ounces.

The habitual substitution of wines, malt liquors, etc., for water is pretty sure in the long run to result in evil, in the majority of cases. For, in the first place, where pure or undiluted wine is drunk the individual is not disposed to take enough to supply the system with the requisite amount of fluid, and if he should everything is upset by the pernicious effect of the contained alcohol. Beer, though containing less alcohol, is open to the same general objections. It should never permanently, or for any lengthened period, be allowed to take the place of pure water. All these beverages are unnatural solvents; besides water they contain many ingredients intolerant to most alimentary canals. Especially is this true in those persons already suffering from deranged digestion.

Water taken at meals in quantities sufficient to satisfy the thirst acts only beneficially. Indeed, an excess will not hurt; for it is quickly absorbed, and increasing the blood pressure favors digestion by thus inducing a freer flow of the juices. It is a digestive agent as well as a food. By the liberal use of water as a beverage the feces are rendered of proper consistency, the intestines maintain their normal activity, and constipation is avoided. The passage of from thirty-five to fifty ounces of urine each day, the result of the ingestion of pure water, tends to keep the kidneys and urinary passages clear of concretions and morbid changes, and with the skin and lungs equally active, the bodily house is well swept. The same result is impossible with artificial beverages. He who stints himself in the drinking of water is dirty inside.

THE INFLUENCE OF EXERCISE UPON HEALTH.

BY PROFESSOR EUGENE L. RICHARDS, OF YALE COLLEGE.

Many old theories of education are being mercilessly discussed. Many new theories claim the places of the old. The classical scholar still claims for the ancient languages the greatest educational power. The advocate of modern languages says life is too short to study dead things, and that modern languages furnish enough discipline, and are, besides, useful. To the scientist, science is god of all, even of education. To him no man is properly educated unless his mind is stored with scientific ideas and trained by the scientific methods of the nineteenth century. Languages, ancient and modern, mathematics, science, philosophy, all advance their claims to be the best educators of the coming man. Meanwhile the coming man is nothing but a child, and must submit himself to his elders to be experimented upon according to the theories of teachers or parents.

For men, women, and children alike, I wish to enter a plea for a part of them much neglected in most discussions on education, and too much left out of sight in most theories of education—the body. In fact, for centuries past, many educators have seemed to regard the body as a rival of the brain, if not an enemy of it. They have apparently been filled with the idea that strength and time given to the body are strength and time taken from the mind. Unfortunately for the cause of good education, this erroneous idea is not held by teachers alone, but is a very prevalent one generally, the current dictum being that, representing by unity a person's force, whatever part of this unit is taken for the body leaves necessarily just that much less for the mind.

To combat this idea, and to replace it by a much more reasonable idea, I had almost said by the *very opposite idea*, shall be the chief though not the only aim of these pages.

To all races which have shown power in any direction the main source of that power has been physical. This is acknowledged to be true with regard to the conquering races of the past. With regard to the present we are too apt to think that the progress of civilization has changed the conditions of power, so that races physically weak, if they are only wise, can successfully compete with and finally overcome the strong races.

Take the Greeks. For along time they were a conquering race—masters of the world of their time. But their influence has extended far beyond their day and beyond the limits of their little world. "It is no disgrace to a nineteenth-century American to go to school to the Greeks. They are still, in their own lines, the leaders of mankind. They are the masters." "Attica was about as large as Rhode Island. Rhode Island is a noble little Commonwealth. Yet it has enjoyed political liberty longer than the democracy of Athens lasted, and in the midst of the blazing light of this much-lauded century. What now is or will be the influence of Rhode Island on the world's history compared with the unmeasured and imperishable influence of Athens? Whence the difference?" * The causes of the difference were manifold. One cause was their physical education. Hand in hand with their mental discipline, which was simple but thorough, went gymnastic exercise. "Until the time of Alexander, the main subjects of education among the Greeks were music and gymnastics, bodily training and mental culture. . . . The first duty of a Greek boy was to learn his letters, a feat which was also coincident with learning to swim. . . . By the fourteenth year the Greek boy would have begun to devote himself seriously to athletics."* Could such a careful and continuous training of the body fail to have its effects upon the mind? It gave the body power. It gave the brain force. Had this force not been converted all the while into intellect and æsthetic sense the Greeks would have formed a race of fine animals only. But their mental discipline saved them. Unfortunately for the permanence of the Greek power, that power was not built upon a moral basis. When, by means of their conquests, wealth and luxury came to them, the Greeks met the usual fate of nations weak in the moral sense. Their discipline was relaxed, and they succumbed to the strong.

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*Professor George P. Fisher, "Princeton Review," March, 1884.

The training of the Romans was largely physical. They were trained for war. But they, too, were overcome by stronger races when they relaxed their own discipline and gave up their martial games and athletic exercises—hiring gladiators for their sport and mercenaries for their battles.

What are the conquering races of to-day? Are they not the nations strong in body—strong by inheritance and keeping their strength by exercise? Germany keeps her men strong in the army by compulsory gymnastic drill. Her schools teach gymnastics. Many of her inhabitants in the cities maintain their strength by the exercise which they have in their excellent Turner system.

England has in the bodies of her children the blood of those old rovers who were the terror of the coasts of Europe in the early centuries of the Christian era, mixed with the blood of that vigorous native stock, to subdue which, even when furnished with only barbarian arms, was no easy task to the Roman legions with all their military skill. In England, too, this physical force is still maintained by vigorous exercise taken by all classes. The higher classes have their out-of-door sports, and some of them of the roughest kind. The lower classes also have their sports. Wherever the English race goes it carries with it the love of exercise and the practice of it. Even their women engage in it. Some of them follow the hounds. They pull the bow. They take walks, the length of which would shame many an American man. So the vigor of the stock never decays. The race increases and multiplies. The little island can not hold it. Away it goes to conquer and colonize the globe, and to infuse its strength into all the races of the earth.

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* "Educational Theories," by Oscar Browning.

What keeps us as a nation from deterioration? The bone and sinew of the land—the cultivators of the soil—the conquerors of our new land—the men who build our cities and the great highways between them, who dig our coal and labor with hand and body in all our factories. It is true that brain directs all this activity, but muscle is the motive power. And the muscle of on generation is the source and support of the brain-power of the following generations. "What else accounts for the prodigal activity"* of the descendants of the early settlers of this country, but the fact that obliged, when cast on a land like our, to battle with the elements and conquer the forests by their own bodily strength, they lived an out-door life in the main, and stored up an immense "capital of vitality" which they handed down to their posterity? Some of that posterity are not content to use the interest of that capital, but are spending the principal. What is the consequence? Not only an enfeeblement of body, and mind, but sterility; and thus, many of the old New England families are dying out in the homes of their race, and are giving place to the strong new-comers.

As to individuals, what kinds of men fight their way to the front ranks in all callings, and hold their places there, as men eminent in their day and generation? Men of strong body. Consider the premiers of England—men like Brougham, Palmerston, and Gladstone—working at an age when many a weaker man would either be in his grave or be preparing for it! Some exercise—horseback-riding or felling trees—keeps up their strength long after three-score and ten. It is only necessary to mention Washington, Jackson, Webster, and Lincoln, to call attention to the fact that among eminent American public men vigor of mind and vigor of body go together. Notice the great pulpit orators of to-day—such as Spurgeon, Beecher, John Hall, and Phillips Brooks. Among moneyed men, did not Commodore Vanderbilt owe something of his vast fortune to his strong body? Could he have endured the strain of building that fortune, and would he have had the vigor to extend it, had it not been for the out-door life of his early manhood? If you find a really successful man, who builds and keeps either a reputation or a fortune by honest hand work, he is generally a man of vigorous body. "All professional biography teaches that to win lasting distinction in sedentary in-door occupations, which task the brain and nervous system, extraordinary toughness of body must accompany extraordinary mental power." † Again, "To attain success and length of service in any of the learned professions, including that of teaching, a vigorous body is well-nigh essential." ‡

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* S. Weir Mitchell, in "Wear and Tear."

† President Eliot, in "Annual Report for 1877-'78."

‡ President Eliot.

It would be out of place to advise a farmer who is already tired of digging and plowing, or a mason who has had enough of bricklaying, to exercise his body. A little play to limber the stiffened muscles might be a good thing. A little brain-work might be better. But of real hard-working exercise of body each workingman gets enough from his day's labor. If he only get good food and enough of it, and have time for sufficient sleep, and get pure air to breathe, and clean water to drink and to bathe in, he will do well enough, as far as bodily health is concerned. But to brain-workers and to all persons of sedentary habits it can be truly said that vigorous exercise of the entire body is not only advisable if they would enjoy health, but that it is absolutely essential to that life. The London "Times," of December 11, 1882, records the physical and mental deterioration which has fallen on the civil servants of India, described by an Indian correspondent: "Since the institution of competitive examinations, out of a hundred-odd civilians nine have died and two have been forced to retire on account of physical debility. Ten more were considered quite unfit for their work on account of bodily weakness, and eight have positively become insane." * Here is a record of twenty-nine out of a hundred persons physically deficient. The hundred belonged to one of the strongest races of the earth. Does not the fact testify to the great demands of civilization on the vitality of the people of modern times? But it will be replied that the climate of India had something to do with the facts. Well, read what Dr. E. H. Clarke says of our country: "No race of human kind has yet obtained a permanent foothold upon this continent. Mounds at the West, vestiges in Florida, and traces elsewhere, proclaim at least two extinct races." "The Indian whom our ancestors confronted was losing his hold on the contiment when the Mayflower anchored in Plymouth Bay, and is now also rapidly disappearing. It remains to be seen if the Anglo-Saxon race, which has ventured upon a continent that has proved the tomb of antecedent races, can be more fortunate than they in maintaining a permanent grasp upon this Western world. One thing, at least, is sure: it will fail, as previous races have failed, unless it can produce a physique and a brain capable of meeting successfully the demand that our climate and civilization make upon it." † Read the following facts with regard to Chicago: From 1852 to 1868, population increased 5.1 times what it was in the first period. The death-rate increased 3.7 times. The deaths from *nervous* disorders increased 20.4 times. ‡ Chicago is perhaps a fast place, but the figures are significant of the wear of city life on the nervous system.

Is not this strain of the nervous system a peculiarly American danger? To be sure, all brain-workers in all countries are liable to it, but in our country climatic influences increase the tendency. Under these influences we have developed national characteristics showing in form and feature. We do things in a hurry. We are in haste to get rich. We are in haste to be wise. We have no time for exercise. We have no time for play. Both exercise and play are by serious people often looked upon as a waste of time for adults, however good they may be for children and young people. A boy must be a man before his time, and a girl must be prim and staid, and must not romp like her more fortunate brothers, but must be a sober woman after she has entered her teens. It seems as if the battle of modern life (at least of modern city life) was a battle of the nerves. "From nursery to school, from school to college, or to work, the strain of brain goes on, and strain of nerve—scholarships, examinations, speculations, promotions, excitements, stimulations, long hours of work, late hours of rest, jaded frames, weary brains, jarring nerves all intensified by the exigencies of our school and city life." * The worst of the mischief is, that this strain falls most of all upon those from nature and circumstance least able to bear it—upon our women. Public opinion frowns upon their exercising like men. Yet, with a nervous system more sensitive than man's, they need the very exercises (out-of-doors) which, by a mistaken public sentiment, they are often forbidden to take. The healthy house-work is often deputed to a servant either because too hard for our American girls, or too much beneath them.

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* Bonamy Price, in ' Princeton Review," July, 1884.
† "The Building of a Brain," Dr. Edward H. Clarke.
‡ "Wear and Tear," Dr. S. Weir Mitchell.

Of the five agents of health—exercise, food, air, sleep, and bathing—exercise, to a certain extent, regulates the demand for the other agents. The muscles, when fully developed, constitute about a half of the full-grown body. The muscular contractions act upon the blood. The blood is the life-stream, carrying the atoms of nourishment to every part of the body, and receiving the waste particles which have already done their work. This process of depositing building substance and receiving waste matter goes on according to a law. This law, called, from its discoverer, the law of Treviranus, is—"Each organ is, to every other, as an excreting organ. In other words. to insure perfect health, every tissue, bone, nerve, tendon, or muscle, should take from the blood certain materials and return to it certain others. To do this, every organ must or ought to have its period of activity and rest, so as to keep the vital fluid in a proper state to nourish every other part." † So that, if we give to the muscles their share of labor, as indicated by the ratio which they bear to the whole body, according to this law, we ought to give a large proportion of our waking hours to their use. But there are certain involuntary muscles doing their work all the time, night and day. In our usual

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* "Physical Training," McLaren.

† "Wear and Tear," S. Weir Mitchell.

vocations, too, however confining they may be, we are obliged to take a certain amount of muscular exercise. Consequently, in the really necessary work of any ordinarily busy person, the muscles do have a fair share of exercise. Still, there are a number of muscles which are used almost exclusively, so that other muscles, with their connecting tendons, bones and nerves, fail, from sheer neglect, to contribute to the health of the whole body. How many women exercise fully the large muscles of the back and loins, or the muscles of the abdomen? Women who wash, or those who work in field or garden. Yet these important muscles, when used, contribute much not only to the health of the body in general, but also to the vigor of the organs lying underneath them. So, too, in walking, how few use the muscles of the calf of the leg? Most people merely stamp along the path or road. They do not use the foot from heel to toe. They fail to rise on the toes at the end of the step, and do not push themselves along with those important members of the foot. Thus they lose the best part of the leverage of that important muscle or set of muscles of the lower leg. The fault is frequently in the shoe of the walker. That has too high a heel, and pinches the toes, making any movement of them painful, even if it does not prevent them from moving at all.

By making regular daily use of the muscles—of all the muscles, if that were possible—we should do one thing toward establishing perfect health of body by allowing to one very large part of it a fair chance to appropriate its proper elements from the blood, and opportunity to give back its used-up tissue to be eliminated from the system in natural and healthy ways. We should be doing more than simply repairing the muscles. We should be also evolving heat —a very important factor of life. We should be assisting all the other parts of our organization to do their work.

Take the heart—itself a very bundle of muscular fibers. We know that as long as we live, whether sleeping or walking, that wonderful organ keeps up its regular contractions and expansions. But, when we use our muscles, their contractile force upon the blood-vessels helps the blood along its channels, and thus takes a little labor from the propelling heart. It beats faster but with less effort.

While helping the heart, muscular exercise helps the lungs also. More exercise means for the lungs more breath; that is, more air inspired, and more carbonic acid gas expired. By deeper breathings the involuntary muscles are strengthened. Moreover, we are made to feel the need of greater lung-room. Even after the age when full stature is supposed to be attained, that lung-room often comes, Nature furnishing the supply according to the demand. McLaren notes the case of one man, in his thirty-sixth year, whose chest, under systematic exercise, increased in girth from thirty-two to thirty-six and a half inches in *two* months. There was an addition of four and a half inches to the circumference of the chest. "An addition of *three* inches to circumference of chest implies that the lungs, instead of containing 250 cubic inches of air before their functional activity was exalted, are now capable of receiving 300 cubic inches into their cells." * This great increase, of four and a half inches, meant not only increase of lung-room, but increase of lung-power.

Taking the quantity of air inspired in the reclining position in a given time as the unit	1
In the same period of time the quantity of air inspired when standing is	1.33
When walking one mile per hour, is	1.9
When walking four miles per hour, is	5
When riding and trotting, is	4.05
When swimming, is	4.33

[TO BE CONTINUED.]

AMALGAM.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA.

There is scarcely a dental journal we receive, but its advertising pages are crowded with notices of different amalgams, or alloys, each purporting to be the *best*, and possessing attributes of non-shrinkage, non-discoloration, preservative qualities, harmony with tooth, bone, etc., etc. Their names have become "Legion." These preparations sell variously from *two to five dollars an ounce.* Under these circumstances it would be a real service to the profession if we give an unbiased judgment of the merits of such as are most popular. For many years we have been using amalgams of various makes: Lawrence's, Flagg's Standard, Chicago Refinery Company's alloys, Welsh's Gold and Platina Alloy, Caulk's Par-Excellence, Sibley's Gold and Platinum Alloy, Johnson & Lund's Extra Amalgam, Virgin White Alloy, Dibbles' White Amalgam, Sullivan's Copper Amalgam, Townsend's Amalgam, Chase's Alcohol Tight Amalgam, Bonwill's Amalgam with prepared mercury, etc., etc., and we have kept a record of their behavior in the mouth. We have used these and kept a record of them to test their claims of non-shrinkage and non-discoloration.

Which is the best amalgam?

The best amalgam according to our idea is that which preserves the tooth in which it is placed best. We regard this as the *first* attribute irrespective of all others, and this attribute we find in *Sullivan's Copper Amalgam*, or "Sullivan's Cement," as it is called. This Amalgam lays no claim to non-discoloration (for it turns very black in the mouth) but for non-shrinkage and preservative effects we have never used anything equal to it. In cavities difficult of access, in cavities where moisture cannot be entirely excluded, in posterior teeth, or in the distal cavities of the bicuspids and molars, it may be used with the most gratifying results.

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* "University Oars," Dr. Morgan. † "Health," Dr. Edward Smith.

Lawrence's amalgam is good, shrinks a little but does not hold its color. Welsh's Gold and Platinum alloy is good also, but shrinks and holds its color only passibly. Chase's alcohol tight amalgam shrinks but little, and holds its color well. Bonwill's amalgam discolors badly, nearly as black as Sullivan's copper amalgam, and shrinks also. Johnson & Lund's extra amalgam holds its color well and shrinks but very little Townsend's amalgam holds its color well and shrinks but little.

It is known that any good amalgam can be manufactured from seventy-five to eighty-five cents per ounce, unless a large quantity of gold enters into its composition, which does not seem, as far as our observation goes, to increase, either its non-shrinkage or non-discoloration. We were inclined to think that high priced amalgams *might possess* better qualities, particularly that of *non-discoloration*, but our observation has proved, in this regard, that they are no better than others. Thus we have found that Dibbles' white alloy at five dollars an ounce did not keep its color as well as Extra amalgam at three dollars, or as well as some of Townsend's amalgam (which was made for seventy-five cents per ounce by Dr. W. H. Trueman and given us to try), or as well as some of Chase's alcohol tight amalgam made by ourselves (according to the formula of Dr. Chase) at eighty-five cents per ounce.

The above is the result of observations we have made extending through six or eight years.

Which is the best way to use amalgam?

We give our mode of filling a tooth with amalgam.

We first apply the rubber dam and them prepare the cavity of decay. We make under cuts in these, but not retaining pits. This being done as carefully as possible, we pour into the palm of the hand a globule of mercury about as large as the cavity, and mix with this the amalgam filings, rubbing these together until they form a paste as stiff as putty. We then put this in a mortar and add a little more of the amalgam filings and with the pestle rub the extra filings into the mass, that was amalgamated in the palm, until all are incorporated. *We use considerable force with the pestle when doing this.* The alloy is now taken from the mortar pretty dry, but we press and mould it into a ball or pellet and place it between chamos skin or a linen napkin and then with a pair of heavy flat nose-pliers we squeeze it flat and exclude as much of the mercury as we can by hard pressure. In this form it is laid on the bracket table, and with a knife or any sharp instrument it is cut up into small pieces from the size of a "mustard seed" to a "duck" shot. With the tweezers these are carried to the cavity and condensed into it with warmed (not hot) instruments. The warming of the instruments makes the amalgam quite plastic so that it can readily be moulded into the cavity or indeed nicely contoured if need be. We have found that amalgam worked in this way is less liable to shrink and yields better results.

THE PRACTICAL PLACE.

THE TOBACCO CURE.—"By the by," remarked Dr. Spitzka, a day or two ago, to a New York *Post* reporter, "you may state that tobacco is likely to prove a great boon in tetanus. It has been successfully employed in relaxing the rigidity of the muscles. It may be employed in various ways. By taking a piece chipped from plug tobacco and steeping it in tepid water it is rendered soft. If then it be placed at the pit of the stomach it produces nansea and relaxation of the muscles. It may be placed with advantage in other positions, and, by continuing this treatment, relaxation may be rendered permanent. So powerful is this remedy that it has been successfully employed in the army in reducing dislocations. To give you an idea of the power of the leaf, if a man should swallow his cigar, and not be able to eject it, he might as well make his will—no power on earth could save him."

Tobacco has also been employed, it is said, successfully in colic, and it is believed that its soothing and relaxative effects may prove beneficial in false hydrophobia.

THE HUMAN FAMILY.—[From the New York *Commercial News*:]—The human family living to-day on earth consists of about 1,450,000,000 individuals; not less, probably more. These are distributed over the earth's surface, so that now there is no considerable part where man is not found. In Asia, where he was first planted, there are now approximately about 800,000,000, densely crowded; on an average, 120 to the square mile. In Europe there are 320,000,000, averaging 100 to the square mile; not so crowded, but everywhere dense, and at points over populated. In Africa there are 210,000,000. In America, North and South, there are 110,000,000, relatively thinly scattered and recent. In the islands, large and small, probably 10,000,000. The extremes of the white and black are as five to three; the remaining 700,000,000 intermediate brown and tawny. Of the race 500,000,000 are well clothed—that is, wear garments of some kind to cover their nakedness; 700,000,000 are semi-clothed, covering inferior parts of the body; 250,000,000 are practically naked. Of the race 500,000,000 live in houses partly furnished, with the appointments of civilization; 700,000,000 in huts or caves with no furnishings; 260,000,000 have nothing that can be called a home, are barbarous and savage. The range is from the topmost round—the Anglo-Saxon civilization, which is the highest known—down to naked savagery. The portion of the race lying below the line of human condition is at the very least three-fifths of the whole, or 900,000,000.

CLEAR SHELLAC VARNISH.—To get an absolutely clear solution of shellac has long been a desideratum, not only with microscopists, but with all others who have occasional need of the medium for cements, etc. It may be prepared by first making an alcoholic solution of shellac in the usual way; a little benzole is then added, and the mixture well shaken. In the course of from twenty-four to forty-eight hours, the fluid will have separated into two distinct layers, an upper alcoholic stratum, perfectly clear, and of a dark red color, while under it is a turbid mixture containing the impurities. The clear solution may be decanted or drawn off with a pipette.—*National Druggist.*

A GOOD IDEA.—Some one in the London *Field* suggests that "if a man wants a carriage or implement photographed so as to make a working copy to scale, all that is necessary is, when the photo is being taken, that a clear and distinct 3-foot rule be placed on the carriage, this is photographed along with the carriage, and no matter what the size of the print or negative, will always be a true scale. It enlarges and diminishes in exactly the same proportion as the carriage.

ILLUMINATING WATER BY ELECTRICITY.—At the new Cirque Nautique in Paris there is an aquatic performance of a very novel character. After the conclusion of the ordinary gymnastic and riding entertainment, the carpet is removed from the floor of the ring, and the latter entirely submerged. A circular pond is thereby produced, and an electric arc lamp illuminates the water from below. The swimming performers appear like mermen and mermaids in the translucent depths of the sea. The general installation throughout the building is a very fine one, and includes both arc and incandescent lamps, the lamps soleil producing a beautiful effect.

RESTING AFTER MEALS.—A friend of the writer's, who has suffered from dyspepsia during almost her entire life, considers the suggestions in the following extracts from an article in a recent issue of *The Journal of Health* to be the most in accord with her own experience of anything on the subject lately published.

Hurried eating of meals, followed immediately by some employment that occupies the whole attention and takes up all, or nearly all, of the physical energies, is sure to result in dyspepsia in one form or another. Sometimes it shows itself in excessive irritability, a sure indication that nerve force has been exhausted; the double draught in order to digest the food and carry on the business has been more than nature could stand without being thrown out of balance. In another case, the person is exceedingly dull as soon as he has a few minutes of leisure. The mind seems a dead blank, and can only move in its accustomed channels, and then only when compelled. This, also, is an indication of nervous exhaustion. Others will have decided pains in the stomach, or a sense of weight, as if a heavy burden was inside. Others, again, will be able to eat nothing that will agree with them; everything that is put inside the stomach is made the subject of a violent protest on the part of that organ, and the person suffers untold agonies in consequence. Others suffer from constant hunger. They may eat all they can, and feel hungry still. If they feel satisfied for a little time, the least unusual exertion brings on the hungry feeling, and they can do no more until something is eaten. It is almost needless to say that this condition is not hunger, but inflammation of the stomach. Scarcely any two persons are affected exactly in the same way, the disordered condition manifesting itself according to temperament and occupation, employments that call for mental work, and those whose scene of action lies indoors, affecting persons more seriously than those carried on in the open air and those which are merely mechanical and do not engage the mind.

All, or nearly all, of these difficulties of digestion might have never been known by the sufferers had they left their business behind them and rested a short time after eating, instead of rushing off to work immediately after hastily swallowing their food.

Nature does not do two things at a time and do both well, as a rule. All know that when a force is divided, it is weakened. If the meal were eaten slowly, without pre-occupation of the mind, and the stomach allowed at least half an hour's chance to get its work well undertaken before the nervous force is turned in another direction, patients suffering from dyspepsia would be few.

A physician once said: "It does not so much matter what we eat as how we eat it." While this is only partly true, it certainly is true that the most healthful food hurriedly eaten, and immediatly followed by work which engages the entire available physical and mental forces, is much worse than a meal of poor food eaten leisurely and followed by an interval of rest.

BACILLUS OF CONSUMPTION.—Dr. Cantani, of Naples, having in mind the fact that bacillus of consumption is destroyed when other bacteria are grown in the same soil, has proposed to eradicate consumption by introducing into the system other bacilli which are injurious only to the germs of the disease. If an organ of the body be attacked by a bacillus dangerous to human life, he would introduce another, harmless to man but fatal to the destructive bacillus. In the case of a consumptive patient, Dr. Cantani introduced a harmless organism, known as the *Bacterium termo*, and found that the *Bacillus tuberculosis* gradually disappeared from the patient's expectorations. The widespread desolation wrought by consumption is more than sufficient to urge the strongest effort on the part of the medical fraternity to discover a successful treatment. It may be possible that this suggestion will bear fruits of the greatest importance. We hope, at least, that it will receive careful investigation.

LITERARY NOTES.

An Index to the Periodical Literature of Dental Science and Art. As presented in the English language, by I. Taft, M. D. D. D. S. Octavo edition 1886. Published by P. Blakiston, Son & Co., Philadelphia, Pa. It contains 212 pages.

This volume is really a boon to all practitioners of Dentistry, as being a means of readily directing the searcher after information, where he may find his inquiries answered. The work is divided into three parts, containing (1) an index to the periodical literature of Dentistry. (2) an index to Dental Periodicals, (3) an index to authors. The scope of the volume extends from the year 1839 to the beginning of the present year. The work is gotten up in the usual fine style of its publishers, and we trust a copy of the same will be in the hands of all practitioners and students of dentistry.

A Practical Treatise on Mechanical Dentistry. By Joseph Richardson, M. D., D. D. S. Fourth edition, revised and enlarged, with 458 illustrations. Octavo size with 703 pages and index. Published by P. Blakiston, Son & Co., 1886. Price, in cloth, $4.50; in leather, $5.50.

This time-honored book appears before us again enlarged and well revised. It is a volume indispensible both to the student and practitioner and its place as a text book on Mechanical Dentistry has never been more well and thoroughly filled. The present edition gives considerable space to the various modes of pivoting teeth, which is so opportune at the present time when this subject arrests the thoughts of the profession to such an extent; while its "first cousin" crown and bridge work is as thoroughly treated. In all the other departments of mechanical, or as it is now termed "Prosthetic" dentistry, the work is elaborate and reliable in its details and description. No student could afford to be without a copy of this valuable work, and the present edition makes it still more indispensible to both student and practitioner.

The volume is well printed with clear, bold, legible type and the entire make-up is creditable to the house from which it is issued.

PHYSICIANS' VISITING LIST, 1887. (Lindsay & Blakiston's.) Thirty-sixth year of its publication. P. Blakiston, Son & Co.

The fact of this little work of convenience for physicians having run through a yearly edition of *thirty-six years*, is a sufficient testimony of the acknowledgement which its service and utility is appreciated by medical men.

Besides the space which it contains for memorandas, refreshment of the memory, dates for visits, etc., etc., it has likewise much other valuable information of ready references. We cannot do better than to give its contents: Superior Lead Pencil, Calander for 1887 and 1888, Marshall Hall's Ready Method in Asphyxia, Poisons and Antidotes, A Description of the Metric or French Decimal System of Weights and Measures, Dose table, Disinfectants and Disinfecting, Examination of Urine, prepared by Dr. Judson Daland, based upon Prof. James Tyson's "Handbook for Practical Examination of Urine," List of Standard Reference Books, Incompatibles, Table for Calculating the Period of Utero-Gestation, List of new Remedies, Sylvester's Method for Artificial Respiration, illustrated, Diagram of the chest.

A glance at the above contents will show several new and practical features that have been suggested by experience, or by those who have used the Visiting List for many years. These additions have been made, however, without increasing the size of the book and without altering its character or general arrangement.

THE ARCHIVES OF GYNÆCOLOGY, OBSTETRICS AND PÆDIATRICS, New York, series of 1886 just completed, has met with such warm encouragement, the publishers have decided to issue monthly, and commencing January, the parts will so appear, instead of bi-monthly as heretofore.

THE

Dental Office and Laboratory.

THIRD SERIES.

VOL. I. PHILADELPHIA, MARCH, 1887. No. 2.

VULCANITE WORK.

ATTACHING THE MODELS TO THE ARTICULATOR—BY DR. THEO. F. CHUPEIN.

(Continued from page 9.)

WHEN the models are to be fastened to the articulator, the pin which serves as a pivot to hold the two parts of the articulator is removed. The base plate is removed from the upper model, and this, as well as the lower model, is placed in a bowl of water. The upper part of the articulator is now laid on a slab of glass or on a piece of paper on a table, and some plaster is mixed with water and a little salt. This is now put, with a spoon or spatula, on that part of the articulator designed to hold the upper model, and the upper model is removed from the water and placed in proper line and position into this plaster. When this has set so as to hold the model to this part of the articulator, the wax base plate is put on the model; more plaster is mixed with salt and water as before, and the lower model is placed in position on the articulating wax. The pin is now inserted so as to connect the two parts of the articulator together, and the lower model is fastened to the lower part of the articulator with the plaster mixed for this purpose. The reason why salt is advised to be used with the water when mixing the plaster to secure the models to the articulator, is because the plaster does not get so very hard with it as when it is not used, and thus the labor of cutting the model from the articulator when the case is ready to be flasked is considerably reduced. Before closing this subject of "the bite" we will enter a word of caution and protest of a manner of conducting this operation by some operators. Some will not go to the trouble of making a lower model as has been described, but will rely on the slight indentation left by the lower teeth on the articulating wax, which, as a guide in arranging the teeth for the upper denture, is almost useless; others will take a lump of wax and bend it, while soft, in the form of a horseshoe, introduce this into the mouth and let the patient bite into it. This is a most careless, unreliable and unsatisfactory method of taking "the bite."

In the manipulations we have thus far described the idea has been to teach how an upper denture is to be constructed, when the base is to be of vulcanite or celluloid, the manipulations for the latter being the same in all particulars up to the time of flasking.

We have now learned how to take an impression in wax, modelling composition and plaster of Paris; how to make the model, how to take the bite, and how to secure the models in the articulator. Our next effort will be to describe the

MOUNTING OF THE TEETH.

The color, size and shape of the teeth having been decided on and selected, preparations are now made to attach these to the base plate. Before this is begun, however, it is well to secure the air chamber in position on the model, as well as to lift or raise the hard parts on the model, so that when the plate is vulcanized it will not press on these, which are unyielding. It has been suggested and advised that, on taking a plaster impression, that these parts be examined, and that the *hard places* in the mouth be traced, as nearly as possible, with a lead pencil, correspondingly *in the impression*, and before the model is made that these places, thus lined out, be scraped or cut away, so that when the model is made this scraping will lift or raise the plate that is moulded on the model, so as not to bring too great pressure at these unyielding points. In like manner, when the model is made, this is to be scraped or cut at the *soft places*, so as to induce pressure of the plate at these points. While there is reason in these suggestions, we fear that there is no certainty in these scraping operations, as we cannot tell for certain how much or how little we have scraped from impression and model. We will suggest a plan which will effect the same object with more certainty. The depots all sell thick tinfoil, which comes in long rolls and may be purchased by the ounce or pound at a nominal cost. It has been our practice to make a fold of one, two or four thicknesses of this (according to the hardness or rigidity of the spot on the gum), and mould it nicely and evenly on the model, and with a pair of small scissors cut out to pattern this fold of tinfoil according to the shape traced in lead pencil on the model. When this is done it is pinned down to the model with the heads of (small) ladies' dressing pins, so as to keep it in place. We do not meddle with the soft places, but simply raise the hard places as described. This being done, the central air chamber is next made. For this purpose we take a piece of stiff brown paper and fold it on itself, and then trace on one side half the shape of the proposed air chamber. Fig. 9 illustrates this. The pattern thus traced is cut

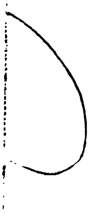

FIG. 9.

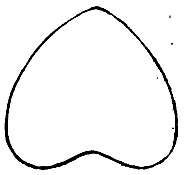

FIG. 10.

out with a pair of scissors, which will be perfectly symmetrical.

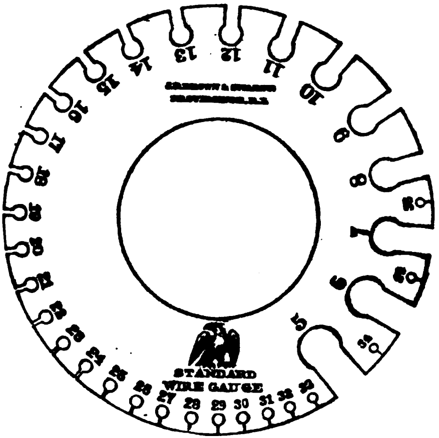

FIG. 11.

The advantage of this is that any shape desirable for the air chamber may be given. The pattern of the air chamber being thus secured, it is laid on a piece of pure tin plate, about No. 18 thickness of the plate, and wire gauge, Fig. 11, and its shape traced with the sharp points of an instrument. It is then cut out with scissors, and three holes punched through it with the plate punch. Fig. 12.

It is laid on the palatine surface of the model in the position it is to occupy, when the three holes are countersunk with a round bur about the size of No. 6 (Fig. 13).

The chamber pattern thus prepared is shown at Fig. 14.

The chamber pattern is now secured to the model with the heads of small pins. This being done, a groove is cut all around the chamber pattern with a small instrument scratching into the model to the depth of the thirty-second of an inch. In forming the air chamber it is better that this should be *large and shallow* than *small and deep.* Fig. 15 represents the model thus prepared.

These preliminaries being completed, we replace the base plate by softening it slightly, so that it will go over the air chamber which has been added to the model.

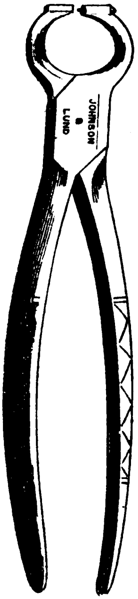

FIG. 12.

If gum section or block teeth are to be used, they are fitted to the base plate by dressing away a portion of the articulating wax until they antagonize properly with the lower teeth. The sides of the blocks should be ground and fitted to each other with great accuracy and nicety, so that the eye may not be able to detect the joint, so as

FIG. 13.

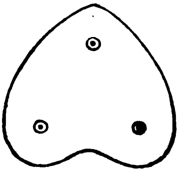

FIG. 14.

to prevent the vulcanite from oozing through, and thus making an unsightly division between the blocks. This is done with a grindstone, as illustrated at Fig. 16, on the polishing lathe Fig. 17. The upper teeth should overlap the lower slightly, but should there be a protrusion of the lower jaw they may be mounted so as to be brought together, edge to edge. The bicuspid blocks should stand slightly inward, and the cusps of these, particularly the outer or buccal cusps, should be ground down so as to accommodate the lateral motion of the jaws. In arranging the teeth on the base plate, the six upper front teeth should not be permitted to strike or touch the six lower front teeth, but should be kept apart about the thickness of cardboard. The bicuspids and molars only should be permitted to strike against the lower teeth. All the teeth being affixed to the plate, they should be tried in the mouth to see if they articulate

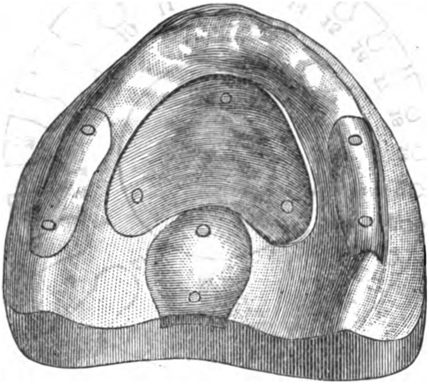

FIG. 15.

Model prepared with raised places of thick tinfoil at the hard parts, and air chamber secured in position.

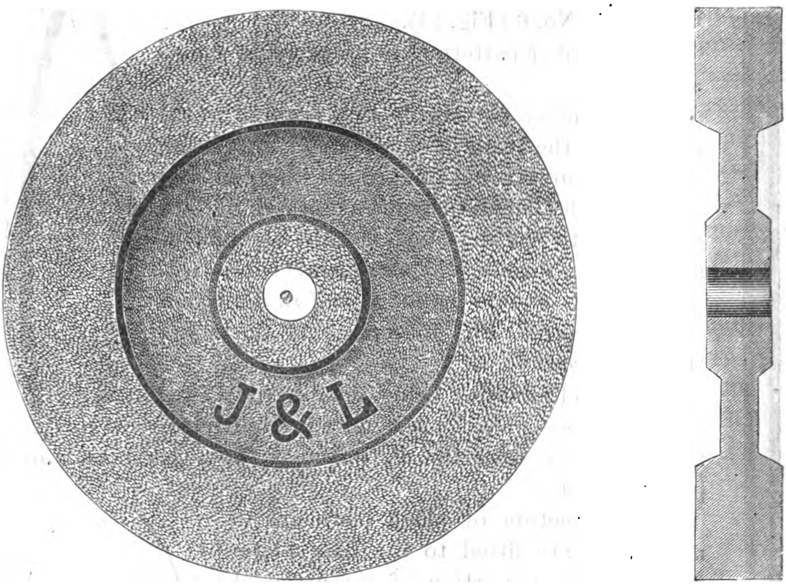

FIG. 16.

properly, if the general expression is pleasing and natural, if the teeth are long enough or too short, if they show too much or too little, if the lips sink or are puffed or full. All these corrections being made, the case is replaced on the model in the articulator, and it is waxed up. This waxing is facilitated with the wax Knife or spatula (Fig. 6 of these papers). A rim of wax is put around the front and above the edges of the blocks this rim should be slightly in excess of what it is intended to be, to allow for filing smooth and finishing. All superfluous wax from the inner or palatial surface is scraped off with the heated wax spatula, and all inequalities made even. The wax is made smooth by the means of short, quick and sudden blasts from a mouth blowpipe directed through the flame of a spirit lamp. This being accomplished, the model with the teeth mounted in wax on it, is removed from the articulator. This is best done by placing all in a basin of water. The water partly softens the plaster,

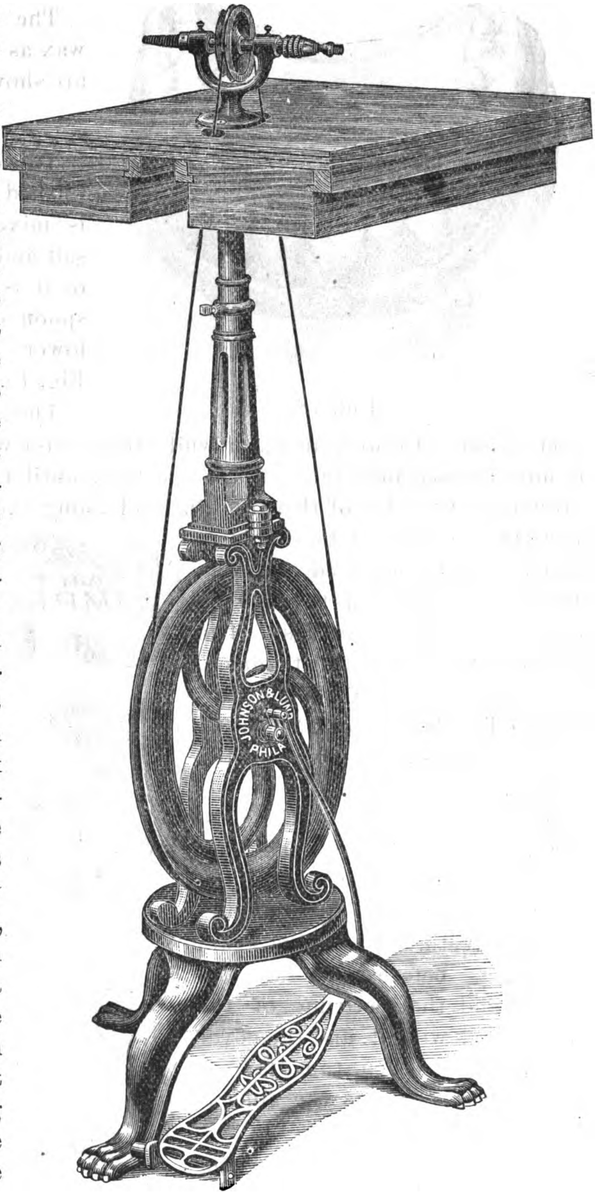

FIG. 17.

particularly that which was mixed with salt' to attach the models to the articulator. It may then be cut away from the articulator and trimmed ready for flasking.

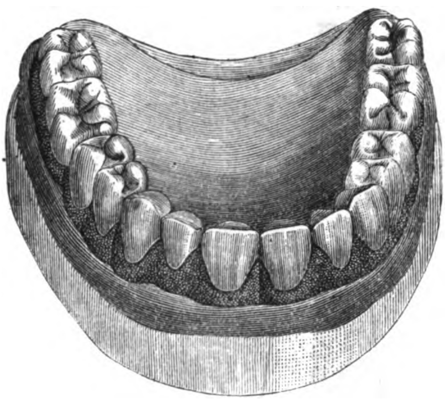

FIG. 18.

The teeth mounted in wax as has been described are shown in Fig. 18.

FLASKING.

This operation is accomplished as follows: Plaster is mixed in a bowl with salt and water, and a part of it is conveyed with a spoon or spatula into the lower part of the flask. Fig. 19.

The model, which had been allowed to soak in water while the plaster was being prepared, is now pressed into this part of the flask until the plaster rises all around to the edge of the wax rim and along the back or posterior part of the wax plate. This is aided or better effected with the blade of a knife so as to halve the case in this part of the flask. The plaster set, it is smoothly trimmed, and varnished with shellac varnish. The flasking of the case so far accomplished is represented in Fig. 20.

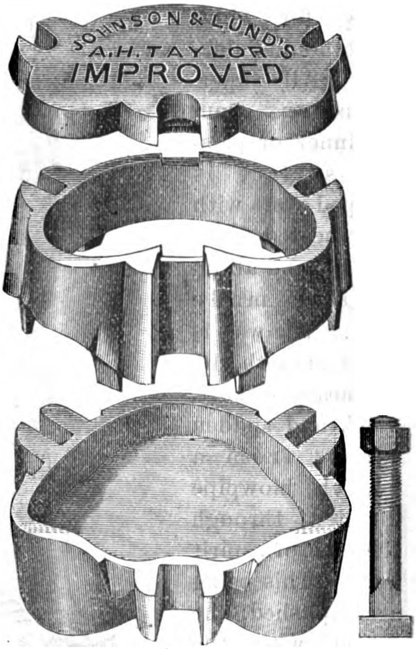

FIG. 19.

The varnished part of the plaster is now oiled and the ring placed on the lower part of the flask. See cut (No. 19) containing the teeth. Plaster is again mixed, as before with salt and water, and the entiring of the flask filled with it, and the cover is put on. When thus far advanced the case has the appearance represented by Fig. 21.

The plaster in the flask being set hard, the flask is warmed sufficiently to slightly soften the wax, when the two halves of the flask are separated—the wax and teeth adhering to the upper half—the model to the lower half. All of the wax is now removed from all parts of the flask and *saved* for the purpose which will be explained farther on. Should any wax remain about the pins of the teeth, it may be cleaned away by pouring a stream of boiling water into the flask, at a slight elevation. This will melt and wash away all adhering particles. Gates or outlets are now cut in the plaster, in this half of the flask, which are intended to serve as vents for the egress of all superfluous rubber. The two halves of the flask is represented by Fig. 22, the one showing the teeth imbedded in the plaster as well as the gates or outlets; the other showing model with the air chamber and raised parts (done with folds of tinfoil as previously described), embedded in the other. The model in the lower part of the flask is now covered with a sheet of thin tinfoil, such as is used for filling teeth. The object of this is to prevent the plaster from adhering to the rubber during the process of vulcanizing. The case is now packed.

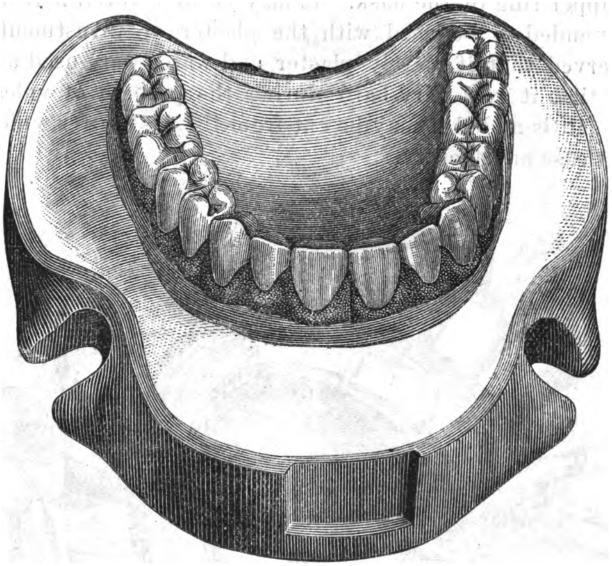

FIG. 20.

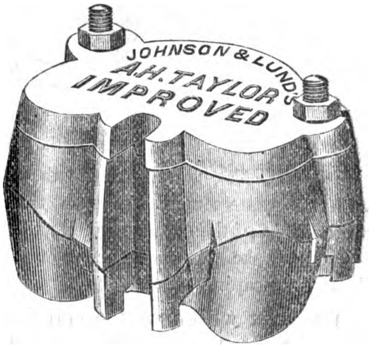

FIG. 21.

PACKING.

Before proceeding to pack the case, the joints on the inside near the pins, between the blocks are nicely and carefully filled with some phosphate of zinc mixed quite thin and allowed to harden thoroughly. This is for the purpose of preventing the rubber from oozing through the joints and thus marring the beauty of the workmanship—this may likewise be done on the outside, before the plaster is poured into the upper ring of the flask. It may be well to tell here why salt is recommended to be used with the plaster of investments. We have observed that if merely plaster and water were used as the investment that it gets very hard during the process of vulcanizing, but when salt is added it may be cut from the flask after vulcanizing with great ease and facility.

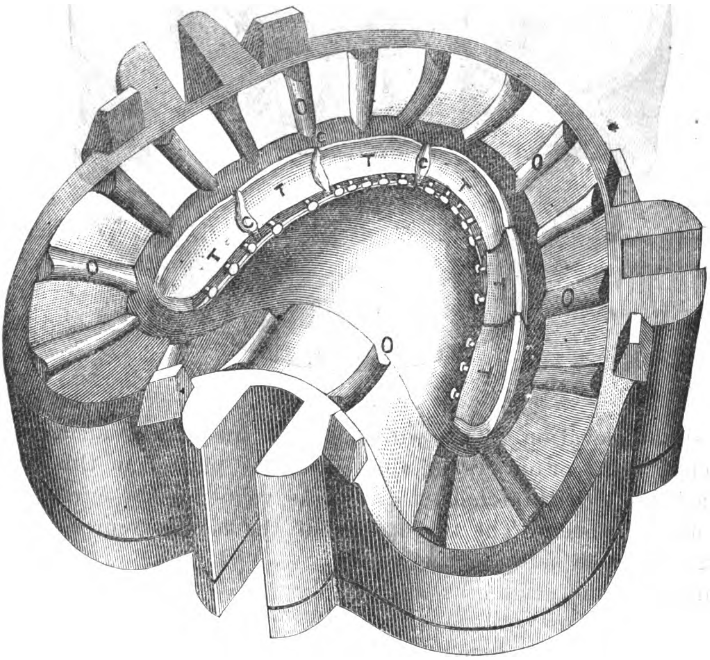

FIG. 22 (upper half).

T T T T T T, represents the teeth, with the pins C C C are three of the joints filled with phosphate cement to prevent the rubber from oozing through—the other joints, on the right of the cut, are done in the same way.

O O O O, &c., are the vents or outlets to let the surplus quantity of rubber have a chance of escaping.

The wax which was saved from about the teeth, as well as the wax rim and wax base plate, are made into a ball and placed into a narrow, high tumbler. There are many thin glass tumblers of this kind sold in all glassware stores.

Water is poured into this tumbler until nearly full. A piece of thin paper is moistened with saliva and made to adhere to the outside, to the height of the water when the wax is in the tumbler.

The lump of wax is now withdrawn from the tumbler, when it will be found that the water in the tumbler will have fallen. There are tumblers of this kind fitted with a cover or top, in which there is a narrow, oblong tube, sold at the depots under the name of "The Rubber Guage." It is better adapted for the purpose and more reliable than the arrangement described of sticking a piece of paper on the outside of the tumbler. The lump of wax being withdrawn and the water subsiding in the tumbler as described. Rubber is cut up in small pieces, about the size of a dime, or smaller, and thrown into the tumbler; this is continued until the water in the tumbler rises to the same level as it did when the wax was in. A few pieces more of rubber may be added, to compensate for any unfilled space during the process of waxing, as well as to compensate for that which was washed away by the boiling water that adhered to the pins. The rubber is then removed from the tumbler and laid on a piece of clean cloth. This is laid over a pot of water which is kept boiling, by which the steam softens it when it is taken piece by piece and packed with suitable instruments into that

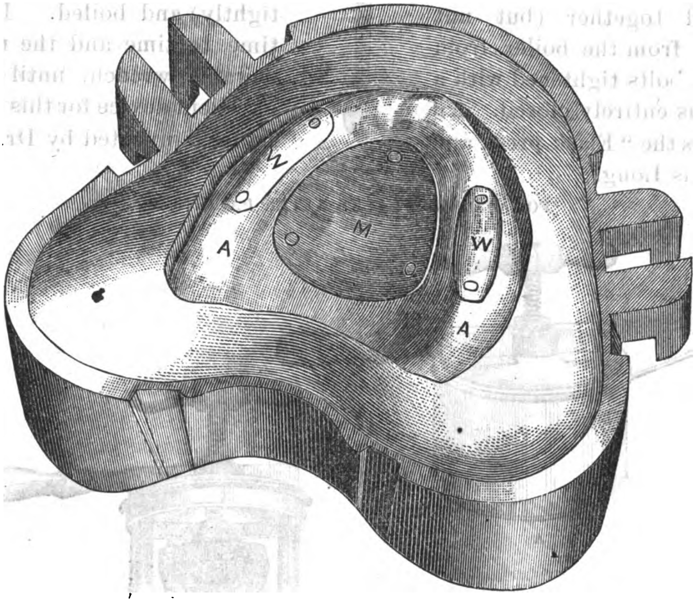

Fig. 22 (lower half).

A A, the model.
M, the air chamber.
W W, folds of tinfoil pinned down to the model, on the hard part of the ridge, designed to lift the plate and relieve pressure.

part of the flask in which the teeth are embedded (Fig. 22). All of the rubber being packed into this part of the flask—the other part of the flask, which contains the model, is now placed in position and directed correctly by aid of the guide-pins with which the flask is provided. The case is now bolted together (but not tightly) and boiled. It is taken from the boiler from time to time and the nuts of the bolts tightened with a suitable wrench, until the flask is entirely closed. An excellent device for this purpose is the "Flask press and boiler," invented by Dr. M. Lukens Long.

FIG. 23.

FOR CLOSING FLASKS AFTER PACKING.

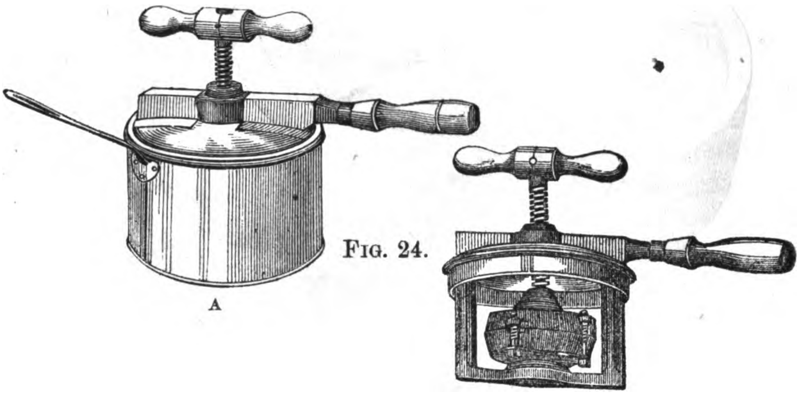

FIG. 24.

With this the rubber is softened thoroughly in the flask by the hot water in the boiler, while the press gradually forces the parts thoroughly and accurately together, not only saving the dirty work of handling the flask, but likewise the danger of breaking the blocks of teeth. There is another arrangement made for closing the flasks, termed the Flask Press (Fig. 25.)

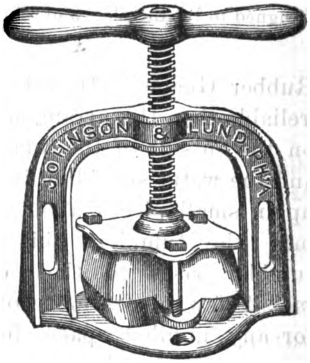

FIG. 25.

But while it does the work it is not so handy, or so tidy as the other to which we have alluded

To be continued.

THE INFLUENCE OF EXERCISE UPON HEALTH.

BY PROF. EUGENE L RICHARDS, OF YALE COLLEGE.

(Concluded from page 18.)

While the lungs and heart are doing better work under the stimulus of muscular exercise, the heart pumping the blood more certainly to the farthermost tissue of the body, and the lungs more rapidly purifying the blood, other organs are benefited. The diaphram, that muscle separating the lungs and heart from the stomach and liver, is rising and falling, and, with the increased expansion and contraction of the walls of the thorax, is moving all the contents of the abdomen to activity. The liver, the great gland of the body, has not only more blood sent to it, but is quickened to action. For bilious people there is no medicine like exercise and fresh air. In malarial districts, bilious people are most easily affected by the malarial poison. Though in such districts a great many troubles are conveniently laid at the door of that enemy of health which do not justly belong there; yet, of the fact that some are affected by it, and others, equally exposed, are not affected by it, may not the explanation be, that an active circulation in one person effects the elimination of the poison through the excretory organs so rapidly that it cannot collect in sufficient quantities to cause disturbance of the system? In the case of a person affected by a stupefying poison, the first thing to be done is to keep the individual moving; that is, to keep the circulation going by exercise till the poison can be eliminated. The laboring-man who works at a sewer in front of a house seldom feels any ill effects from the overturned soil and poisonous gas, while some dweller in the house, apparently not so much exposed, is stricken with typhoid or malarial fever. Causes of the immunity to the workman may be found in his greater strength and feebler sensibility, and in his open-air life; but may not another reason be seen in the quickened action of his lungs and the profuse perspiration of his skin? As to the effect of want of exercise on the liver, the following passage may be quoted from an authority on the subject; "A want of exercise in the open air leads to derangement of the liver in two ways, viz.: (*a*) By causing a deficient supply of oxygen to the system, as a result of which the oxidizing processes, which go on in the liver and elsewhere, are imperfectly performed, and there is a tendency to the accumulation in the system of fat and the imperfectly oxidized products of disintegrated albumen. Oxygen is, so to speak, the antidote for the destruction of *materies morbi* (lithic acid, etc.) produced by imperfectly oxidized albumen. (*b*) By retarding the circulation of the blood through the liver. Since the time of Haller (1764), physiologists have recognized the influence of the respiratory movements in producing the circulation of blood through the liver; but upward of thirty years ago Mr. Alexander Shaw showed more clearly than ever before that the circulation of blood through the liver was greatly influenced by the alternate expansion and contraction of the thorax during respiration. Mr. Shaw called attention to the fact that the portal vein, without any provision for increasing its power, 'has to perform the duty usually fulfilled by an artery.' He suggested that this weak power, by which the portal vein propelled its blood, was compensated for by a suction force communicated to the current of the blood by the actions of respiration. These reasonings have been confirmed by certain experiments of M. Bernard." "In persons, then, who lead a sedentary life, this auxiliary force for promoting the circulation of blood through the liver is diminished; blood stagnates in the gland, and the functions of the organ are deranged, these results being all the more likely to arise if the liver be at the same time over-stimulated by errors in diet." *

Take another organ. The stomach is a muscular organ, being furnished with bands of muscular fiber, which squeeze and press the food, turning it over and over, so that it may be the better permeated by the juices which digest it. It, too, is stimulated by exercise, especially by an exercise like walking or riding, which increases its movement. This motion makes easier work for the organ and increases its activity. It increases its activity also in another way, by demanding more of it For increased work by any part of the body means increased destruction of tissue. "To repair the waste is the office of the blood, as the distributor of the material to be supplied. The main furnisher of this new material in the right form to do its work is the stomach. For food is both the fuel which keeps our bodily machinery going, and the material by which the machinery itself is repaired. The stomach, with the duodenum, is the place where all this material is prepared to do its work in the most economical way. More exercise, then, means more waste, more waste means more repair, and more repair means a greater demand for food and water. The more, then, we waste any part of the body by exercise (within certain limits), if there is due repair, the better off is that part. The strength of the body, as a whole, and of each part of the body individually, is thus ever in relation to its newness."†

The bowels, too, the great sewers of the bodily system, inclosed in pliable walls needing constant motion and fresh supplies of blood for their healthy exercise, feel the action of the breathing lungs, and are

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* Functional Derangements of the Liver," Murchison.
†McLaren.

sensible of every turn, twist, rising and falling of the body. Deprive the body of exercise, and you deprive the bowels of blood and proper action, and bring in a long train of evils, a catalogue of which can be read in the advertising columns of almost any daily newspaper.

The kidneys, too, are affected by physical exercise. Doubtless they receive a certain stimulation from the motion communicated to them in exercise, but as they are engaged in the work of eliminating from the system its excess of liquid with certain effete matter in solution, and as the skin is also concerned in a similar work, they are affected by exercise mostly with reference to this joint action. The more active the skin is, the less work the kidneys have to do.

To realize more definitely the work which the skin does, consider the fact that a square inch of skin is calculated to contain twenty-eight thousand pores. These pores, if healthy, are at all times purifying the blood by insensible perspiration, and in times of vigorous exercise make that perspiration very sensible. This sensible perspiration is essential to health, for the pores must occasionally be opened wide and flushed, in order to cleanse them thoroughly. Not only is this action of the skin in exercise increased by the increased flow of blood to the surface, but also by the mere motion of the muscles under the skin. This last effect might be called the direct effect of exercise on the skin. How close this connection is between the skin and muscles may be seen from the fact that "any part of the skin of the hand is in connection with, perhaps, two hundred muscles." This "fact, showing the exceedingly numerous and complicated communications between a given portion of the skin and the moving organs,"* makes it easy to conceive how the skin is stimulated to action directly by exercise.

Bodily exercise is essential to the healthy action of the brain and the nerves. There is no real conflict between brain-work and body-work. Brain presupposes body; can not exist without it; is dependent upon it for support and nourishment. Brain can not communicate with the external world, nor with other brains, so far as we know, except through the medium of the body. Consider how brain-power is formed and grows in a child. Is not the first exertion of mental power, as well as the first sign of life, connected with motion? Back of the child's outstretched hand there is in the mind a desire for something and a will to obtain it. Each consciously directed muscular action has two effects, one on the muscle used, another on the directing brain. Can there be any doubt that this mutual action of brain and body contributes to the growth of each? Can there be any further doubt that, the more organs which the brain supervises, and the more muscles which it controls and directs, the more opportunity the brain has for growth? "Brain is evolved from the organization."† First, there is "growth, the force for which was supplied from a hundred sources;" and, secondly, there is "a power grown. . . . . No perfect brain ever crowns an imperfectly developed body." This, then, up to certain time of life, is Nature's method of forming brain power, viz.: by the conscious activity of the bodily powers. The fact that most people are right-sided, as well as right-handed is registered in their brains; the *left* side of the brain, which supervises the *right* side of the body, being generally the larger.

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* Bain.

In this growth of the brain, the whole nervous system is involved. The spinal cord (almost a continuation of the brain), and every nerve which from each organ brings intelligence of want, and every nerve that flashes the order to supply that want, all are brought into action by exercise, and all are nourished by the circulating blood. Think of the immense strain upon the bodily powers to keep the brain and nervous system properly nourished! It is calculated that the brain alone requires one-fifth of the entire supply of blood in the body. The drain upon the bodily vigor of a brain-worker would be greater than this fraction represents, if it were not for the law of Treviranus, according to which an organ not only takes from the blood certain materials, but also supplies to it other materials. "Just as, on a larger scale, the carbonic acid exhaled by animals is taken up by vegetables, and a poison thus removed from the atmosphere in which the animal lives, so by one organic element of the body the blood is purified from the waste matter of a higher element, which would be poisonous to it."* So, that a tired brain and quivering nerves may not be more wearied by physical exercise, but may be refreshed by it. This refreshment may result from two processes: first, by withdrawing the excessive supply of blood from the before active organ; and, secondly, by purifying the blood so that it may be ready to properly nourish the brain. And the muscular system not only acts as a store-house of vitality for the brain, and a purifier of its supply of blood, but it covers the nervous system, acting as its stay and protection. "To be weak is to be miserable. . . . . Susceptibility of nerve and feebleness of muscle generally go together." To correct one deficiency is usually to cure the other weakness.

To the young, physical exercise is essential to growth, both of body and mind. Youth is not only the time to cultivate good habits, but also the time to store up vitality. At that time many abnormal developments can be corrected by appropriate exercises. At that period, too, the healthy balance between brain and body can better be established. To children, exercise is specially needful for healthy nerves, since, as compared with the nervous system of an adult, the nervous system of a child is five times as large, in proportion to the size of the body. In them, therefore, "that parasite of the blood," the brain, demands that a greater amount of time should be given to waste and repair of tissue by means of exercise, and that a greater amount of proper food should furnish the supply nourishment. Short intervals of study, long intervals of play or light work of body, and that in the open air, if possible, should be the rule for children. As they increase in years more time can be given to conscious celebration. At some periods of growth, all the way from the age of twelve to eighteen, according to the individual, special watchfulness is required of parents and instructors to see that the functions of growing organs are not interfered with by excessive attention to brain-work. At this critical time no study would be safer than too much study.

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† "Building of a Brain," Dr. Edward H. Clarke.

* Maudsley.

After a good muscular system has been developed in childhood and youth, a comparatively small amount of time judiciously devoted to exercise will keep a person in healthy working order till near the age of forty.

The age of forty to fifty is the period of life during which, according to the best authorities, the need of exercise is the greatest. "At no time of life is the necessity of exercise so imperative.* At that time the circulation becomes defective, unless continually quickened by exercise;" there is a tendency to passive congestion and functional derangements of various organs, especially the liver. At this time, though needing less food, we are apt to eat more than in the periods of life immediately adjacent. Consequently, the products of disintegrated food and tissue are not eliminated. Accumulating in the blood, they form the *materies morbi*, the matter on which death feeds.

Tiding over the period of middle life, by using appropriate exercise, and by care to see that all the excretory organs do their proper work at proper times, we ought to find the following years the best years of life, especially for brain work. If we lived rightly, the words of the poet ought to be true for us all:

> "Grow old along with me!
> The best is yet to be,
> The last of life for which the first was made;
> Our times are in his hand
> Who saith, 'A whole I planned,'
> Youth shows but half: trust God; see all, nor be afraid." †

As to kinds of exercise, each person must be thrown on his own judgment with regard to his own case. In McLaren's "Physical Education," and in Blakie's "How to Get Strong and How to Stay So," most excellent hints will be found for all cases. In beginning a course of systematic exercise, it is wise to err on the side of doing too little rather than too much. Increase the amount of exercise very slowly. No discouragement should be felt if it is hard work at first. It will become easier and easier. It may be a long time before it can be taken joyfully, yet, if any person will persevere, he will be certain to rejoice in the work, and will come to feel that he can not do without it. There is no royal road to health any more than there is to learning. Like all things made precious and to be really enjoyed, health must be earned.

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* "Exercise and Training," Ralfe.

† "Rabbi Ben Ezra," Robert Browning.

It may be said that, for all persons whose regular occupation is sedentary, exercise in the open air is to be preferred. The oxygen of the air is essential to the life of the blood. It is well also to take exercise as much as possible in company. One person encourages another. A man will often take part in exercise with a companion so as not to disappoint him, even if he would not exercise for his own sake. Hence one valuable feature of games or athletic sports. They must be carried on in company and by system. Another valuable feature of games and sports is that in them the mind is occupied without being taxed. It is diverted from its usual cares. The sports is that in them the mind is occupied without being taxed. It is diverted from its usual cares. The sports are well called recreative. Both body and mind are recreated by them.

To affect the chest and the underlying organs, such as lungs and heart, the most direct means lies in exercise of the muscles of the arms and shoulders. If a person has weak lungs, one of the first objects at which he should aim should be the strengthening the muscular system covering the chest. If such a person is weak, let him begin exercise very cautiously, and increase very slowly the duration, frequency and difficulty of his exercises until he is made to breathe hard. In taking a full inspiration, not only are the lungs affected, but, strange as it may seem, the brain and spine also. "The fluid surrounding the brain and spinal cord is essential to their safety. The motions dependent on the actions of the heart are much weaker on the spinal cord than on the brain, while those connected with breathing are more constant and considerable on the former, from the more powerful distension of the veins of their spinal canal. . . . The fluid surrounding brain and spine regulates the vascular fullness," and "it is manifest that, in order to keep up the proper alternations between the brain and spinal cord, and between the heart and lungs, it is not enough to breathe pure air, but it is also necessary that it should be *deeply* breathed.*

The effect of exercise on the character is felt most of all on the will. This is very natural, for in all muscular exercise a certain amount of resistance has to be overcome, and the power which acts through the muscles to overcome this resistance is will-power. Development of muscular strength is, therefore, to a certain extent development of will. It becomes the development of the highest kind of will, that of self-mastery—when to take exercise a man resolutely overcomes the distaste for it. This feeling often comes upon us, when we are weary with brain-work and are inclined to rest, and to forego exercise. But let any man resist the temptation and take the exercise, and he will find that the brain is rested and refreshed, and the whole body renewed and invigorated.

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* Dr. George Moore.

It is not true that so much given to body is just so much taken from brain. It has been the aim of the writer so show that all parts of the body, the brain and the nervous system among the rest, contribute to the vigor of the whole; that the muscular system forms about half of the body, and is a very important contributor to the health of all the organs. Body and brain are parts of a harmonious whole. Either nelgected makes trouble for the other. Each appropriately exercised means not only strength, health and to that one, but vigor to both. This hue and cry against exercise and sport, as being detrimental to mental culture, is founded on a mistaken theory that the material and spiritual parts of a man are enemies—so much less material, so much more spiritual. But it ought to be observed that a very high authority says it is the carnal *mind* which is enmity against God," and "out of the *heart* proceed evil thoughts, murders, adulteries." Man is not more of a "brute" for cultivating his body, but a better man if he cultivate both body and mind: body, first in the order of development; mind, second in order of time, but the crown and king of the whole.

THE PRACTICAL PLACE.

SENSITIVE DENTINE.

Dr. J. W. Clewes is glad the "Cocaine" craze is over for attempts to lessen the pain of extraction. His experience teaches him that a better agent is found in chloroform. He saturates cotton, the size of a large pea, with it. Let some be inhaled, some swallowed with the saliva, and the cotton itself applied to the cavity. Then proceed with your excavation. You may repeat the chloroform if you like, *but only once*. The magical effect will soon show itself, without any appearance of anæsthesia in the patient. So eminently satisfactory will be the result that a mutual gladness will prevail.—*Dental Cosmos.*

Dr. Horatio C. Meriam, D. M. D., of the Dental Department of the Harvard University, read a paper entitled, "*Gutta-Percha and its uses* *in Operative Dentistry*," before the First District Dental Society of the State of New York, from which we make some extracts gleaned from the *Dental Cosmos*.

"Its use in fitting by impression is of importance in treating cavities difficult of access. A small piece of gutta percha is softened by heat, and pressed into the cavity after excavation without drying. This gives the impression of the cavity; remove, and trim even with the outline of the cavity. This is then dropped in the oil of cajeput, heated, the cavity dried, and the gutta-percha carried to place and pressed home. The same method can be employed in cavities on the lingual side of the lower third molar, or in cases so far below the gum that complete dryness is impossible. The pressing in of the gutta-percha, coated with this soft mass, carries with it the moisture of the cavity, and we get adhesion under water.

* * * * * *

I have no desire to recommend this, except in extreme cases.

* * * * * *

As a matrix in large cavities for retaining medicine, especially when applying arsenical paste, a piece may be fitted between the teeth, and pressed out from the inside with oiled cotton, formed with burnishers, and made water-tight, and thus give for this purpose all the advantage of a crown cavity. The same may be used when filling with amalgam, for we can easily arrange for the rounded approximal contact or kunckle so much desired with a heated burnisher pressed into the gutta-percha matrix where we wish the point of contact to come. One advantage of this matrix is that it can be worn without irritation to the gums, and need not be removed until the amalgam is hardened. It is my practice to cover all dressing with a piece softened in oil, not only for cleanliness between the visits of patients to the office, but I am much better able to judge of the progress of disinfection, as it can be seen that all the odor, if any, is from the canals and not from cotton foul from being warm.

* * * * * *

It may be well to state why I introduce the use of oils for softening instead of using chloroform. Chloroform completely dissolves it; I only wish to soften the surface.

NEW HÆMOSTATIC.—The methods of checking bleeding are important, and therefore, interesting to all surgeons, but especially to dentists, who so often have to deal with troublesome hæmorrhage after teeth extraction. When such hæmorrhage occurs in the case of "bleeders" (Hæmophiles) the matter assumes alarming importance. Dr. Morales, of Barcelona, has found hazeline, (exatrct of witch-hazel,) when locally applied, to act successfully, as a styptic in hæmophilic patients when all other means, not excepting the thermocautery, have failed. Dr. Morales is of the opinion that it acts by constricting the vessels as well as by producing coagulation.—*The Britsh Journal of Dental Science.*

NAUSEA.—The excessive nausea which some patients have when an attempt made to take an impression of their gums, especially when plaster of Paris is used for the purpose, is said to be entirely overcome by the use of a four per cent. solution of hydro chlorate of cocaine used in the form of a spray from a common hand-atomizer and thrown against the palate, or with a camel-hair pencil painted over this surface, in from three to five minutes.

TO OBTAIN ADHESION FOR ARTIFICIAL-TEETH PLATES.—An exchange states that this may be accomplished by sprinkling over the surface of the plate powdered gum Tragacanth. The powdered gum is put in a bottle, over the mouth of which is tied a piece of muslin or tarletan. Many plates, though made on the model, from a perfect impression, fail at first to adhere either from the inability of the patient to create an exhaustion or from some other cause. The above is given by several dentists who have used it successfully, some going so far as to say that considerable force will, at times, have to be used to remove the plate when this is used. The suggestion is simple and worth the trial.

FILLING FOR PULPLESS TEETH.—The editor of the *Dental Register* has found Iodoform a useful filling for pulpless teeth. After removing the *debris* of the pulp, it is directed to wash out thoroughly with alcohol and work in with a broach a thin paste of idoform made either with alcohol or glycerine. When the root is full, wipe away the surplus and cover with oxyphosphate. The whole operation, including the filling, may safely be done in one sitting.

PEARLINE.—"Pearline," a laundry powder, sold by all grocers, is an excellent preparation for removing stains from the hands and finger nails. Try it after handling flasks and laboratory tools.

A SOLDERING FLUID, for brass or iron, composed of a teaspoonful of chloride of zinc dissolved in two ounces of alcohol, will not rust and tarnish, and has no bad odor. We found the above was best made by dissolving fused chloride of zinc in alcohol.

IT is believed that strabismus is not due to the presence of a micrococci in the blood.

THE cutting of India rubber may be greatly facilitated by moistening the knife used with a moderately strong solution of caustic soda.

EXPLOSIVE MIXTURES.—Chlorate of pottasa and sulphur explode readily upon trituration. They should therefore be ground separately and mixed after.

Lycopodium explodes if any of the dust falls into gaslight. Mix in the daytime.

Hypo-phosphite of calcium explodes at a high temperatures easily.

Oxalate and citrate of calcium explode at high temperature.

Permanganate of potash and any organic substance explode readily, *almost instantly*, upon being mixed together.

A mixture of chlorate of potassa or potassium, glycerine and ferric chloride explode almost instantly if super-heated. Leave out glycerine always,

Ozone powders are *very* explosive.

Iodine and ammonia explodes easily.

Sulphuric acid and oil of turpentine explode during the manufacture of tereben, a new compound among physicians.—*Nemo in Medical Summary.*

MIXING AMALGAM.—Dr. E. O. Peck, of Morristown, N. J., writes to say, "If you will take a *depressed rubber dam* and put your mercury and amalgam filings in to rub together, you will never put them in your hand again, as by the dam you have clean hands; to say nothing of its being a so much better way to mix amalgam. I was told of it many years ago, and have told it to many others, and would not give it up now for any other.

OBTUNDENTS.—Preparatory to the use of an obtunder the cavity should be opened with a chisel and the debris washed out with warm water, the rubber dam should then be adjusted, and if the necks of the teeth are sensitive or the gums tender, they ought to be painted or swabbed with the tincture of cannabis indica slightly warmed. The cavities should then be dried, after which pellets of cotton moistened with alcohol may be introduced and quickly removed, and the obtunder, whatever it should be, should then be placed in the cavity and allowed to remain while you are operating on some small fissure or other non-sensitive cavity. By so proceeding you inspire the patient with confidence, gain time for the drug to act, and allow the alcohol to evaporate, which is in itself a tolerable obtunder. By preference, and from confidence in the drug, I am still using the fluid extract of cannabis indica. I find that, used in the above manner, it acts more rapidly than any other known drug which is not injurious to the teeth. In previous papers I have cautioned against too free use of the fluid extract, as it is poisonous in large doses when accidently used, one-half to one minim being the ordinary dose, while five to twenty minims of the tincture may be given with safety.

You will find that the tincture of cannabis indica and the fluid extract are extremely valuable in other directions than that of obtuding dentine, as you can open an abscess almost painlessly by pricking its surface two minutes before introducing the lancet. By soaking a pulp with the fluid extract for a few minutes you can remove it without pain, provided you have free access to it, so that the brush can be plunged into the canal without unnecessary fumbling around the entrance. You can use the tincture for injections around the root of a tooth, when there are fine deposits on the sides which would cause great pain in removal without its use. I habitually make great use of it with perfect results. I have extracted a few roots of teeth by injecting a drop on each side, and also painting the gums adjacent to the roots, and waiting for five minutes before removing them. The tincture should be warmed before using it for this purpose.—*Dr. Hailand in Independent Practitioner.*

A GOOD DEFINITION.—"D. D. S. or M. D.: Which?" by Geo. H. Chance, D. D. S. It will be admitted that dental surgery is a mechanical art applied, from a medico-scientific standpoint, to the dental organs and their associate parts, for the arrest and cure of disease, precisely as general surgery is a mechanical art applied from the same standpoint to other parts of the human body, and for a similar purpose, viz., for the arrest and cure of disease. Now, if the foregoing definition be accepted as correct, it logically follows that dental surgery is a legitimate branch of the healing art, and consequently a department of general medicine.

If you wish to become a dentist in something more than name, you must avoid the professional pirate, whether he sails a large ship or a small one, for we have both kinds. Secondly, place yourself with a respectable, well-informed dental suageon, who will direct you in your preliminary studies and properly prepare you for a dental college. Thirdly, don't bother yourself about the mystical title of M. D., for after you have honorably graduated as a dental surgeon you will know why it is that in this country, at least, the once honored title of M. D. is largely a thing of the past. And when you are a dental surgeon, if you be a true man and would do unto others as you would they should do unto you, you will then seek, in general medicine, in the arts and sciences, or wherever else it may be found, what you will feel you must need—more light and more knowledge.

IF A BOY TALKS in a high, effeminate voice, cultivate his chest tones patiently but firmly—he will bless you in later years for what at present sorely tries his patience. Be careful that your girl has that "most excellent thing in a woman"—a soft voice. Any inclination to stammering should be watched; the child should be trained to read aloud very slowly and deliberately. As it may prove helpful to some one, I will quote a set of rules given by Charles Kingsley to cure stammering, only premising that a child could be taught to hold the upper lip down with the finger during his half-hour of practice. Open your mouth. Take full breaths and plenty of them, and mind your stops. Keep your tongue quiet. Keep your upper lip down. Use your lower lip. Read to yourself out loud. Read and speak slow, slow, slow."—*Brooklyn Magazine.*

PLASTER OF PARIS IMPRESSIONS, MODELS AND INVESTMENTS.

From the last edition of that excellent work, "*Richardson's Mechanical Dentistry*," we glean some items on the above caption which may be useful hints. Experiments were made by several parties on the behavior of Plaster of Paris, mixed thick, mixed thin and mixed of medium consistency—of different makes of Plaster—mixed with warm and cold water; mixed with salt, with alum, &c., &c. After giving the warpage and expansion, one of the experimenters says: "The conclusion I draw from this is, that all plaster, either for impression taking or for models, should be cast with potash alum, when strict definite results are to be obtained; and that in the case of gum block work, that opening of the joints—which has hitherto caused so much trouble to practitions, and, to a great extent, has prevented the more general adoption its other merits might have commanded, and which has drawn out many suggestions as to the best mode of prevention—the opening of the joints may now be entirely prevented by the use of potash alum for both matrix and model within the flask."

The quantity of potash alum recommended is three to four ounces to a gallon of water. The Plaster to be mixed of medium consistency, —neither too thick, or too thin—the filling of the impression, to make the model, as soon after removing it from the mouth as possible, and the earliest practicable use of the model on which to mold the substitute.

THE SOURCE OF SCARLET FEVER.

As the effects of Scarlet Fever are so often manifested upon teeth, the following will prove interesting:

"A report recently issued by the medical officer of the British Local Government Board presents interesting details of an investigation which appears to have disclosed the original source of scarlet fever, and which, if provisional conclusions should be confirmed by more extended observations, may lead to the extinction of that very destructive disease. That outbreaks of scarlet fever, as of diphtheria, are often connected more or less closely with a particular milk supply, has long been known to persons engaged in sanitary investigations. It has been a familiar observation that cases of scarlet fever were frequent among the customers of certain dairymen, while other consumers, similarly circumstanced but getting their milk from other dealers, seem to enjoy immunity. The theory, however, has prevailed that the persons who served the milk were affected by the disease; and when the boy who carried milk to customers was found to have scarcely finished peeling it seemed superfluous to look beyond him for a cause of the spread of the malady. The new view, to which a close study of outbreaks occurring last December in South Marylebone, St. Pancras, Hampstead and Hendon gives strong support, is that the milk itself is the cause of the fever. The districts named, and also St. John's woods, where the scarlet fever appeared at the same time, were supplied from a dairy the sanitary condition of which was excellent. None of the persons employed at it, or in any way connected with it, had had the fever recently, nor had there been a case of scarlet fever in the vicinity for a long time. Although the dairy was indisputably the centre from which the disease was being disseminated, it was impossible to trace any source of human infection. By dint of careful inquiry it was ascertained, however, that the commencement of the fever coincided in the point of time with the arrival of four newly-purchased cows, and it was found practicable to connect its ultimate distribution in different districts with the places successively occupied by these cows in different sheds the supplies of milk from which went into hands of different dealers. The four cows on examination turned out to be suffering from an erupted disease of the udders, which produced but little apparent illness, so that they continued to feed satisfactorily and to give plenty of milk. The case against the cows at last became so strong that a dealer among whose customers the fever was prevailing returned his supplies upon the hands of the farmer. The latter ordered the milk to be thrown away, but some of it was obtained from a cowman by poor people near by, with the result that there was an outbreak of scarlet fever among their children a week later. The disease attacked a half dozen families, but none that had not partaken of the rejected milk. The affected cows being placed under observation, it has been found that the erupted disease possesses peculiar characteristics, and that it not only spreads by ordinary contact among animals, but can be communicated to calves by inoculation. Matter obtained from ulcerations has been cultivated in various media, and particularly in milk, in which it was found to flourish abundantly, producing strings of micrococci possessed of special character. The sub-cultures thus produced being used for inoculation are found to be more virulent than the original virus. Calves were made extremely ill—one was killed, by inoculation with the sub-culture, while but little affected by treatment with virus flesh from the cow. The conjecture is made that in milking a diseased cow pressure upon the udder brings down into the pail infected particles from the sore places left by the eruption, and that the milk into which they fall practically corresponds to an artificial culture of the micrococcus, such as has been found capable of exciting serious and fatal disease when introduced into calves by inoculation. Inoculated calves killed for examination were found to be suffering from inflammatory changes in several vital organs, and especially the kidneys, of a kind absolutely indistinguishable from those that occur in the same organs in the course of human scarlet fever. That persons taking the strings of micrococci developed in milk into the stomach would have the scarlet fever has not been demonstrated by experiment; through the experience of the families that used the milk that was ordered to be thrown away may be said to point to that conclusion. To boil such milk thoroughly would destroy the scarlet fever micrococcus, if such there be. Science may, however, be invoked to provide us after a time with better means of neutralizing this and other disease germs.—*American Journal of Dental Science.*

BLINDNESS DUE TO DECAYED TEETH.

Dr. Wldmark, a Swedish surgeon, having as a patient a young girl who was completely blind in one eye; observing considerable defects in the teeth, sent her to M. Skogsborg, a dental surgeon, who found that all the upper and lower molars were completely decayed, and that in many of them the roots were inflamed. He extracted the remains of the molars on the right side, and in four days' time the sight of the right eye began to return, and on the eleventh day after the extraction of the teeth it had become normal. The diseased fangs on the other side were subsequently removed lest they should cause a return of the opthalmic affection.—*Scientific American.*

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VULCANITE WORK.

By Dr. Theo. F. Chupein,

Continued from page 34, Vol. 1, No. 2.

The case being now packed with rubber is ready for the vulcanizing process. This consists in changing the rubber from a soft to a hard substance and is the discovery of Nelson Goodyear. He found that if pure rubber were mixed in certain proportions with sulphur and then subjected to a certain degree of heat in an air-tight vessel, the rubber was changed from a soft to a hard substance. The instrument used for this purpose is called a Vulcanizer, and is illustrated at Fig. 26.

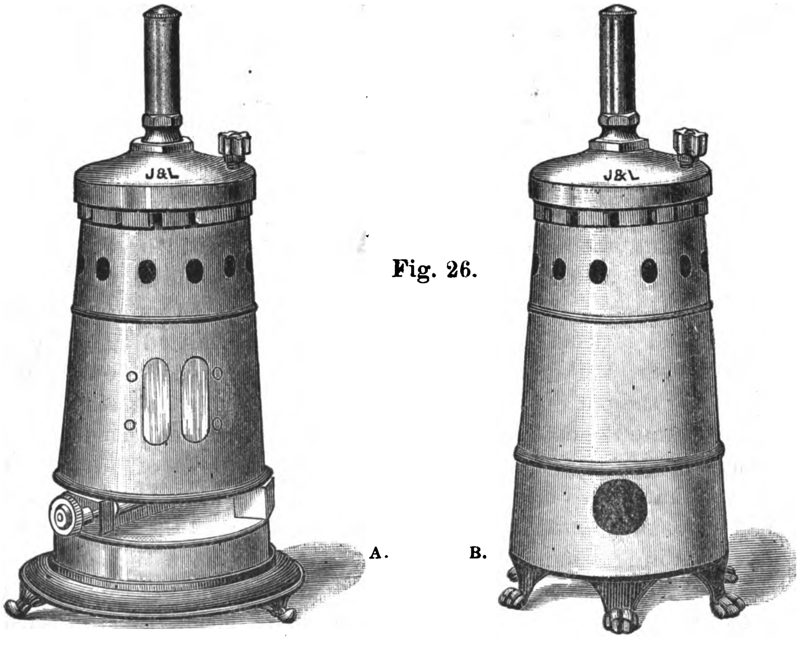
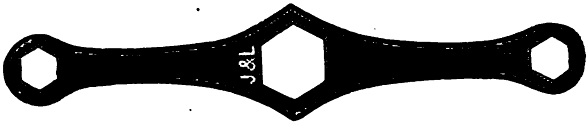


Fig. 26.

In the illustrations set forth, one vulcanizer, letter A, is heated by means of a coal oil stove, the jacket or outer covering being set on the stove. The other, letter B, the heat is derived from illuminating gas—the jacket, covering a Lunsen burner which furnishes the heat. This last is by far the best, where gas is available—being cleaner, more regular and more prompt in its working.



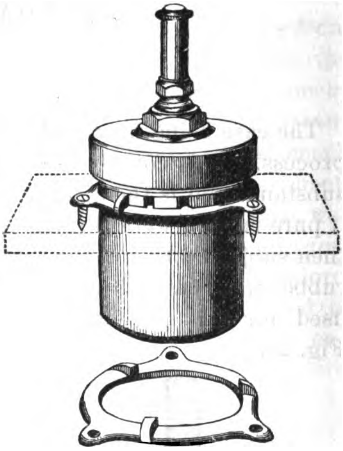


Fig. 27.

Fig. 27 represents the pot and cover set into a bed-plate for the convenient use of screwing it down tightly. The pot consists of a very strong vessel made of sheet copper, brazed so as to withstand both heat and great steam pressure. At its mouth or orifice it is furnished with a strong screw-thread to which the top (which is made of brass and supplied with a thermometer to register the degree of heat) is secured. To vulcanize a case the flask, which has been packed as described, is put into the pot and partly filled with water. The top, or cover, is then screwed down securely to the pot and set over the burner to be heated. The heat is permitted to continue until the mercury in the tube of the thermometer marks 320° degrees on the scale. At this point it is kept from rising any higher by diminishing the heat, and the temperature is kept at such a point that the mercury is retained at this point, not being permitted to rise higher or fall lower than 320° degrees, for 55 or 60 minutes. After the expiration of this time the gas is shut off (if gas is used), or the burner extinguished (if coal oil is used) and the vulcanizer is permitted to cool down. If, however, the case is hurried it may be cooled down rapidly by lifting the pot out of the jacket and setting it in a basin of water to accelerate the cooling. When the mercury in the thermometer has fallen, by this cooling, so as to mark 200° degrees of heat, the top may be unscrewed and the flask removed. The flask, however, should not be opened until *it is perfectly cold*, as well as the plaster investment within. This being accomplished, the nuts on the bolts of the flask may be unscrewed, and the plaster investment cut away, and the set of teeth cleaned of all adhering plaster, by means of stiff brushes used with water. Fig. 28.

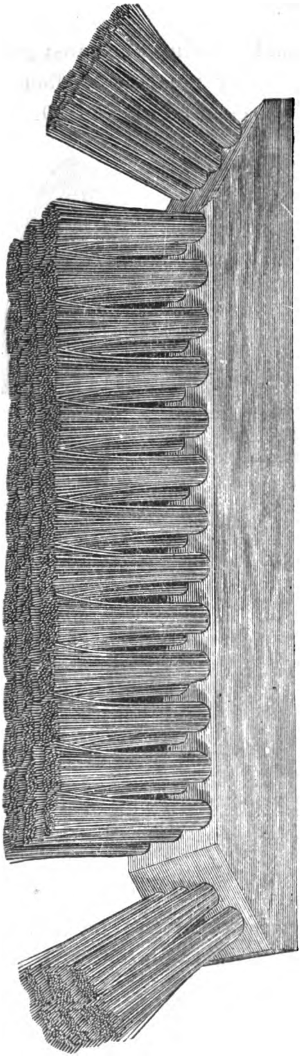


Fig. 28

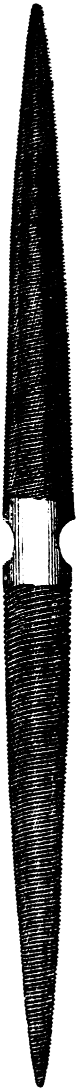


Fig. 29

It has been observed that rubber, or vulcanite, as it is also called, is better cured or cooked if during the process of vulcanizing it is *kept out of water.* For this purpose it has been our practice to place in the bottom of the pot, the ring of an old flask, or indeed anything of the kind that will keep the flask, containing the work, out of the water. Only so much water (less than a half pint) should be put into the pot, as will barely come to the top of the ring placed in the bottom of the vulcanizer for this purpose, and on this ring the flask should be placed and the operation of vulcanizing proceeded with as has been described. For this reason we would recommend the purchase of what is known as a 3-case vulcanizer; for with one of this size two cases can be vulcanized at the same time, and both flasks kept out of the water by the means we have suggested. A very convenient device to have in the laboratory, to aid the memory with, is a "dumb clock." This may be made of a piece of card board and figured like the face of a clock, with the two hands working independently of each other by being rivetted to the card board. Its use will be as follows: Suppose the mercury in the thermometer of the vulcanizer has risen to the point 320° degrees at *a quarter past 9 o'clock.* You will then turn the hands on the dumb-clock so they will mark *a quarter past 10 o'clock*, for at that time you will know that the heat is to be shut off. This is only suggested as a little convenience, to aid to memory.

The case being removed from the flask and investment, as described is filed into shape with what is known as vulcanite files. Fig. 29.

FIG. 30 HALF ROUND FILE C.

This form—of which several sizes are made—being the most generally useful. For cutting down the concave or palatine surface of the plate, the different forms of lathe burs represented at Fig. 30.

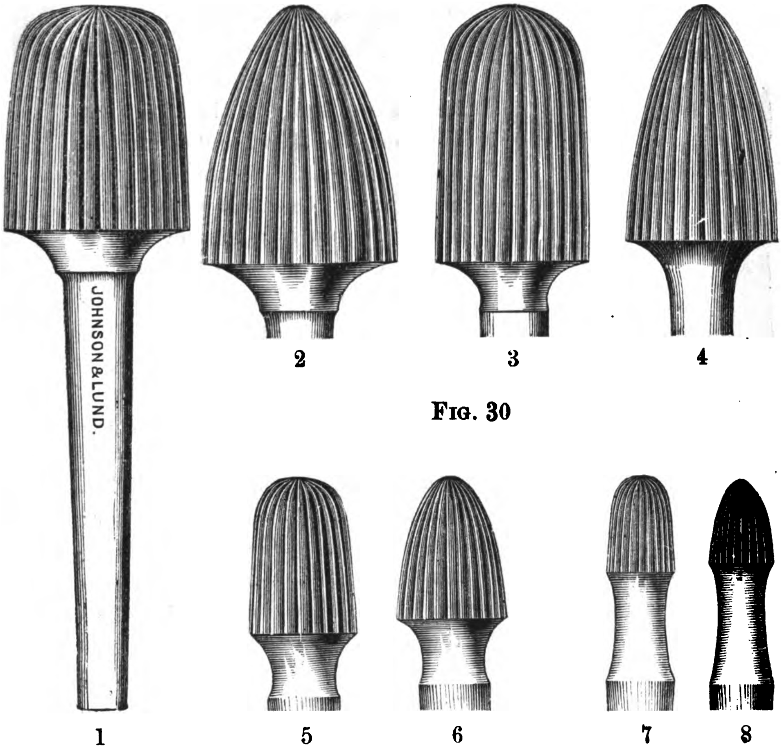


FIG. 30

will be found very convenient. As these, however, are injured or made dull by contact, during their revolution on the lathe, with the porcelain teeth, the finishers represented at Fig. 31

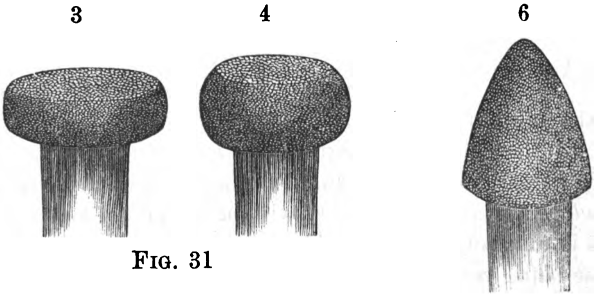
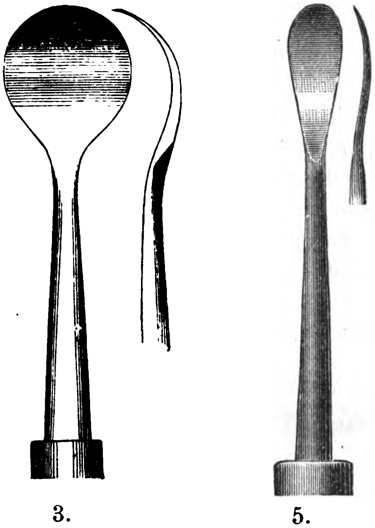


FIG. 31

will be found also very serviceable for this purpose. The forms 3, 4 and 6 will be found the most useful. All the excessive roughness of the plate being partially reduced by these appliances, it is further reduced in bulk and thickness by the use of vulcanite scrapers, Fig. 32.



FIG'S. 32.

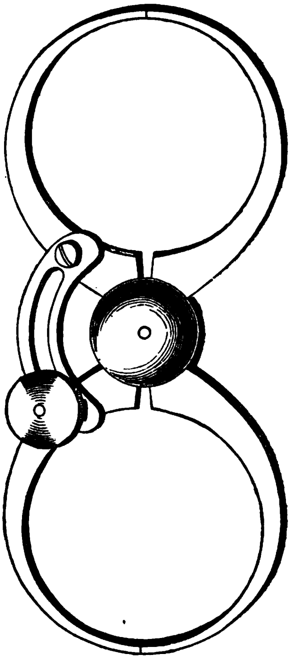


FIG. 33.

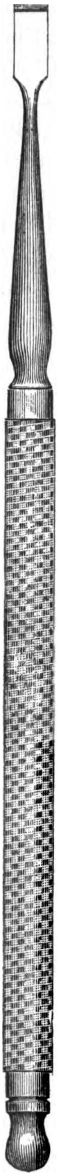


Fig. 34

These two sizes and forms being the most useful, it is necessary to caution the operator during the progress of this reduction of the thickness of the plate, for fear it may be made too thin or that he cut through the plate into the air-chamber. For this purpose it is well that he provide himself, with a pair of calipers, FIG. 33.

With this instrument, the thickness or thinness of the plate may always be determined. The points of the instrument are opened and passed on the upper and under surfaces of the plate, and then pressed together. By examining the opposite points of the instruments, the thickness of the plate at any point is determined. The outer rim of the plate is reduced with the flat side of the vulcanite file, and all jagged edges of rubber which lie next to the porcelain facing representing the gum, be cut clean and smooth with an enamel chisel, such as is used for operating on the teeth, FIG. 34.

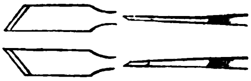


FIG. 35.

Or the two instruments (Fig. 35) will be found very serviceable for cutting away the rubber that adheres to the teeth on the palatine surface of the plate.

The plate having been filed into shape and reduced in thickness with the lathe-brush and scrapers, it is made smooth of all file marks with sand-paper. When this is done it is rendered still smoother by the use of cork or felt wheels, used with finely powdered pumice stone and water, driven or revolved on the polishing lathe (see Fig. 16 of this article). When every scratch or blemish is thus removed, whiting mixed with water is used on the plate, to obtain the final polish. This is used with the wheel-brush on the polishing lathe, Fig. 36, made of fine, soft bristles, is the best size for the purpose—it is known as No. 18, soft bristles, 3 rows and 2 inches in diameter. In using the brush-wheel for polishing, the lathe should be revolved at a high rate of speed. A suggestion has been recently made in one of the English journals relative to the final polishing of rubber plates, for which we can vouch as to its efficacy. After the plate has been made perfectly smooth and free of all scratches by the cork or felt-wheels and powdered pumice stone, it is scrubbed perfectly clean with a brush, soap and water, and then dried. A drop or two of oil (no more) is placed on the palatial surface of the plate, the plate being held in the left hand. A teaspoonful of fine, dry plaster-of-Paris is now put over the oil and this is rubbed with the thumb of the right hand for a minute or two. The rim is treated in the same way, only that the forefinger of the right hand is used as the polishing implement. A beautiful polish may be obtained in this way. The case is again washed with soap and water, with a soft brush like that represented by Fig. 37.

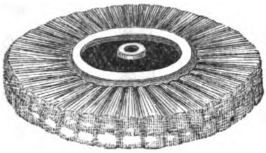


FIG. 36.

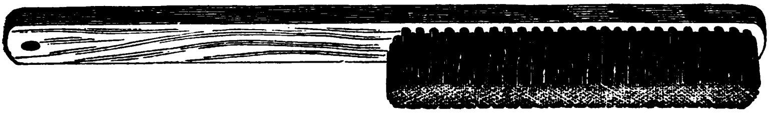


FIG. 37.

Should it be determined to make the case of celluloid instead of vulcanite, the manipulation will be precisely the same up to the time of flasking. A celluloid flask differs from a vulcanite flask in the former having very much longer guide pins and in having no bolts. The case is invested in the celluloid flask in precisely the same way as has been described for flasking the case when vulcanite is to be used. No salt, however, is mixed with this plaster for investment. The parts of the flask are separated in the same way, but the wax is not saved, as was the case when rubber was used. The wax being all cleaned away by the use of boiling water poured into the flask—a celluloid blank of suitable size is selected. This is fitted to the case as nearly as possible; the part of the flask having the teeth imbedded in it being below, the blank is placed into this and finally the part of the flask having the model is set on to these last, and held into place by its long guide pins. The flask is now set into the celluloid press, which is illustrated at Fig. 38.

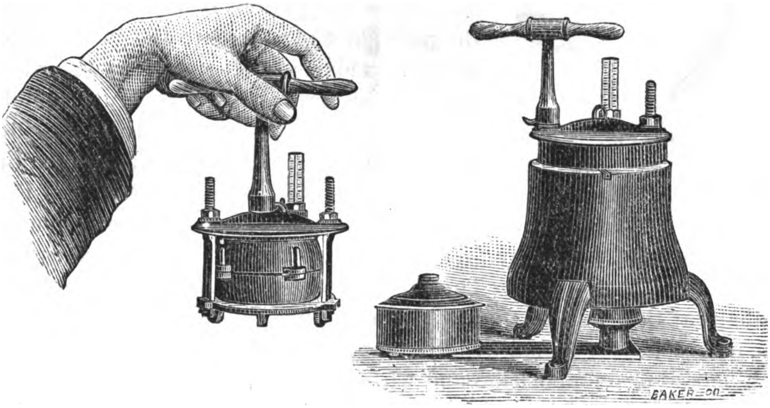


FIG. 38.

The heat is now applied and when the mercury in the thermometer —with which the machine is provided—marks 250 degrees of heat the case may be screwed down tight, applying the pressure of the screw little by little. It is only necessary to let the case get *perfectly cold*, when it is cut out of the flask, cleaned of all adhering plaster and finished up in the same way as has been described to finish up a rubber case.

We have thus advanced in our instruction in vulcanite work from the taking of the impression to the final completion of the case.

This instruction has been simply for an upper set. We propose now to go over the ground of how an entire set—upper and lower—is constructed. But as the manipulation of making the model, grinding and mounting the teeth on wax—waxing the case—flasking, packing, vulcanizing and finishing for the lower jaw, being precisely the same as what has been described for the upper jaw, it will not be necessary to repeat these processes.

TAKING AN IMPRESSION OF THE LOWER JAW.

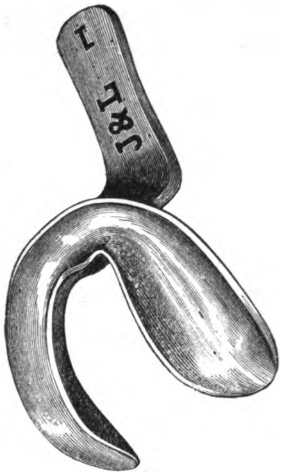


FIG. 39.

To take an impression of the lower jaw, where no teeth remain, an impression-cup, such as is shown at Fig. 39, will be necessary, the same being of proper size. Impression-plaster is placed into the cup and this is carried into the mouth, the operator holding the cup by the handle and standing to the right and slightly in front of the patient. When the cup and plaster in it is brought to its position over the ridge of the jaw before settling it down on the gums, the patient is directed to raise the point of the tongue to the roof of the mouth. This is made necessary in order to obtain an impression of the gums which lie far back in the mouth towards the throat, and which is often obliterated or rendered imperfect by the mass of integuments about the root of the tongue. Indeed this part of the gum of the lower jaw is frequently difficult to take, especially for old persons where there is an excessive absorption of these parts. The cup has frequently to be bent or altered in shape at these points, and even this at times fails to afford a remedy. The most successful plan we have found for such cases is to fill the cup with modeling composition and when this is pressed on the gum, the cup is held down with one hand, and, before the material gets hard we introduce the finger into the mouth and press the material against the gum at these points. The material thus manipulated is kept in place until it is hard enough to remove from the mouth without bending. It is then immersed in cold water until it is quite hard. When hard it is cut and trimmed, with a pen-knife, to its smallest dimensions, so as not to interfere with its re-introduction into the mouth. It is then dug out to the depth of an eighth of an inch, in the same way as was done for the case of a high arch, as illustrated at Fig. 2 of a former paper, on the inner or concave surface, in the places all over the ridge where the plate is to rest, and this is scored or undercut to prevent the plaster from leaving it when it is withdrawn from the mouth. Impression plaster is then mixed and placed into this prepared receptacle. The cup is again put into the mouth and settled into its position over the gums. When the plaster hardens it is removed from the mouth and the model made as has already been described.

The models being made for both jaws, for an entire denture, base plates are moulded on them, as already described. The base plate for the lower jaw being so very narrow and without strength, (when made of base plate wax) should be strengthened by bending a piece of iron wire in the shape of a horse-shoe, (or approximate to the shape of the case in hand,) heating this, and while hot laying it on the wax base plate, in which it imbeds itself from its temperature; this will materially strengthen it. Articulating wax is now placed on both upper and lower base plates and trimmed into shape. Fig. 40.

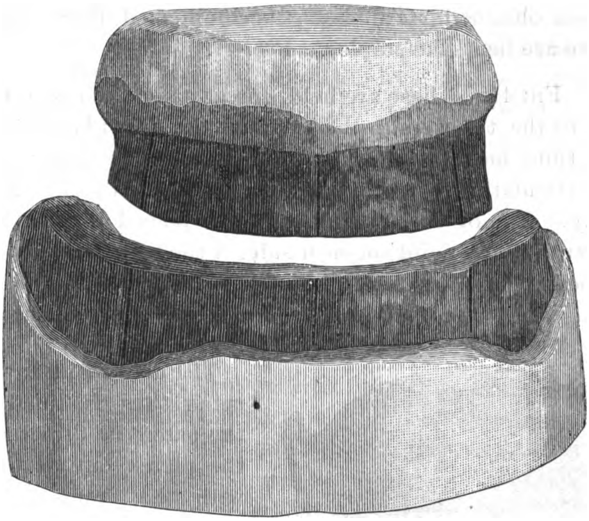


Fig. 40.

represents the articulating wax placed on the base plates as has been described.

TAKING THE BITE FOR AN ENTIRE DENTURE.

The base plates with the articulating wax on them being thus prepared, they are placed in the patient's mouth and settled into place. The patient is directed to close the jaws on the wax, having moistened the masticating surfaces of the same with the tongue to prevent them from adhering. The lips are then drawn back and the articulating surfaces of the wax examined where they touch, and are marked. The plates are removed from the mouth and these points are cut away.

They are again inserted in the mouth and the same examination and marking made and corrected as before. This is repeated until the masticating surfaces of the wax touch evenly all around. The wax is also to be dressed off or added to, to restore all fullness and depressions. These being all accomplished, three marks are made on the articulating wax running from the upper to the lower base plates. One mark at the median line and one on each side in the neighborhood of where the 1st or 2d bicusped tooth would be. This being done the patient is engaged in conversation and told to close the jaws, not too hard, on the articulating wax. After repeated trials in this way, if the marks on the wax are found to come *always in the same place*, on the jaws being closed, it is fair to presume that the correct bite has been obtained. This being accomplished, three little pieces of iron wire are bent like staples. Fig. 41.

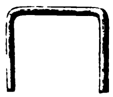


FIG 41. These are held, one at a time, between the points of the tweezers in the blaze of the spirit-lamps and when thus heated they are pushed into the upper and lower articulating wax, one half into each, the lips being held out of the way. One of these little staples is placed at the median line, the other two at any point, on each side, in the neighborhood of where the bicusped teeth would be.

FIG. 42.

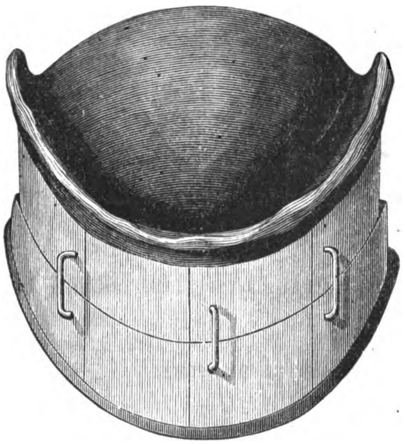


FIG. 42.

The upper and lower plates being thus fastened together the patent is directed to push the plates out of the mouth with the tongue. Fig. 43. represents the upper and lower plates, thus united.

The upper and lower models are now put into their base plates, and these are secured into the articulator in the manner described for doing this when simply an upper denture was being made.

The mounting of the teeth for a lower case is precisely the same as the mounting for an upper. The articulating of the teeth, for an upper and lower denture requires more care and nicety of manipulation than when simply one or the other is under construction; but the operation is not attended with very great difficulty. We find it preferable, in entire cases, to mount the lower teeth first, and then antagonize the other to them..

When the teeth are all mounted in wax, they are tried into the patient's mouth, and any alteration found necessary in the position of the teeth is corrected. The plates are then removed from the mouth, and waxed as before discribed. In packing the low case, *weighted rubber* is sometimes used to give greater stability, by weight, to this denture, which only depends, in many cases on its weight, or on the knack of the patient to keep it in place. Sometimes instead of weighted rubber the case is *loaded* by placing or imbedding in the rubber small pieces of thick pure tin plate. This however is not so good as when weighted rubber is used, as frequently pieces of the thick tin plate crops out on the outside of the plate and make a blemish on the mark.

The tin foil which was put on the upper model, to prevent the rubber from adhering to the plaster, is removed by immersing the case in a solution of nitric acid and water, in the proportion of one part of acid to two of water. This leaves the plate perfectly clean and smooth.

To be Continued.

THE TEETH OF THE APACHE INDIANS, says Dr. Corbusier, are often decayed but not affected with tartar. These Indians do not maintain their stolidity under minor surgical operations, the extraction of a tooth almost always eliciting a groan or a yell.—*N. Y. Med. Journal.*

THE FATHER OF HIS COUNTRY suffered from bad teeth as may be inferred from the following letter to a firm of commission merchants in London: "Dear Cary," he wrote to the senior member of the firm, "Mrs. Washington joins me in warm thanks to you for your considerate present of two large stone jars of pickled tripe. I must ask you to arrange for four similar jars, in wicker basket casing, packed in outer casks, to be shipped for my account direct from the owners. Dental infirmity impels my caring for this necessary item in our domestic commissariat."—*Youth's Companion.*

"CERTAIN OF NOTHING."—The great teacher of evolution in Germany, Virchow, pursued the subject till he found it had no positive proof, and then candidly pronounced it "an unverified hypothesis." Haeckel, now the champion of that dogma, and himself formerly a pupil of Virchow, rose up against his teacher, and in the excess of his mortification at the defection of his master, he declared that the same is true of all science—that we are certain of nothing—that all knowledge is good enough till something more conclusive and satisfying is *supposed* to be true, and then we accept the new and reject the old. What a field of inquiry does this bold assertion of Haeckel open to the young student's mind!—*N. Y. Observer.*

PRACTICAL PLACE.

Tannin for Ingrowing Toe-Nail.—A concentrated solution (an ounce of perfectly fresh tannic acid dissolved in six drachms of pure water, with a gentle heat) must be painted on the soft parts twice a day. Two cases recently had no pain nor lameness after the first application, and went about their work immediately, which they could not do before. After about three weeks of this treatment, the nail had grown to its proper length and breadth, and the cure was complete. No other treatment of any kind was used, though formerly I introduced lint under the ingrowing edge in such cases.—*British Medical Journal.*

Tit for Tat.—One Day a Man cum into the Bosses Offis, and says he, mister, I am A Stranger which cum A hundred 50 Miles To Get sum Teeth filled; can you do it right Away? the Boss he Thot a Minit and says he, No I'm afeard Not; I've got A all-Day appointment With judge perkinsis Wife. so The Man went of, and after a While the Boss he Got tired Waiting for miss perkins to cum, so he Went and Cleaned out the Seller and Shuveld Cole all day. Late that Evnin Dr. Jones cum in Smokin a 15 sent sigar, and he Slapped the Boss on the Sholder, and says he, hello, sanders, you dun me A good turn Wen you Sent that Stranger over To my Offis this a. m. I Dun Forty-4 dolers an' 50c. worth Spot Cash fur him. The Boss looked Kind o' dazed fur a Minit, and after a Bit he remarked That he be Dam if he Ever had A Bit of Luck. One day About a Weak later miss perkins cum saling in Just as Me and the boss was trying to put a Clamp on the wisdum Tooth in a Sucker's mouth, and Says, she, doctor, I'm Ol Reddy; Kin you Wait on me rite Away? I Seen he was Mad, but he Smiled kind o'pleasant, an' says He, cum in After diner an' yu'll find The chair unoccupied. she Went of, Looking like she Thot that Wasn't the way She was Expectin' to be Treated. After diner she Cum in an' says kind o' commandin'; Wher's The dentist? an' says I, he's gone Fishin'. Gone Fishin' Gone Fishin'? says she turnin' red. Yes, says I; he'll be back 'bout crismus. Says she, you Tell him i've Gone to Another dentist wot's More puntchul. He'll never Do no more Work fur Our family. So There!

[This fable teaches us that when you are not quite certain about the temper of your metal, it is not a bad plan to keep several irons in the fire.] *The Cincinnati Medical and Dental Journal.*

A NEW COLLODION.—A new film-producing material which is said to possess many advantages over the time-honored solution of gun cotton in ether, is made, according to a writer in the *Union Pharmacule*, by mixing 3 parts of gum mastic, in powder, and 1 part of balsam of Peru, dry, and dissolving the whole in 5 parts of Chloroform. When an analgesic effect is desired one part of narcotine may be added to the gums and dissolved with them in the chloroform. Silk or linen cloths may be soaked in the mixture and dried and afterwards used as court-plaster.

NEW LOCAL ANESTHETIC.—A crystalline substance has been obtained in minute quantities from the rind of pomegranates, which when placed on the tongue or other portions of the mucous membrane, paralyzes local sensation after the manner of cocaine.

HOW TO CURE WARTS.—Place the thumb upon the wart, and press it against the bone. Move the wart back and forth upon the bone until the roots become irritated or sore, when the wart will disappear· I have had quite a number upon my hands, and have got rid of all of them in the above manner.

THE Senate of Pennsylvania has passed a bill providing for the infliction of capital punishment by electricity. If we are not mistaken, it was the *Scientific American* that first advanced the idea of applying electricity for executions, and it was not long after our publication that two or more patents were issued for chairs provided with wires for the purpose.

ARTIFICIAL WHETSTONES.—The *Guide Scientifique* describes the following method of making artificial whetstones. Gelatine of good quality is dissolved in its own weight of water, the operation being conducted in a dark room. To the solution 1½ per cent. of bichromate of potash is added, which has previously been dissolved in a little water. A quantity of very fine emery, equal to nine times the weight of the gelatine, is intimately mixed with the gelatine solution. Pulverized flint may be substituted for emery. The mass is moulded into any desired shape, and is then consolidated by heavy pressure. It is dried by exposure to strong sunlight for several hours.

COCAINE NERVE PASTE.—Dr. Kirk employs the following formula for a preparation for devitalizing dental pulps composed as follows: R.—Acid. arsenios. pulv., cocainæ hydrochlorat, $_{aa}$ gr. xx; menthol cryst., gr. v.; glycerini, q. s. to make a stiff paste. This paste he finds more reliable than the usual arsenious acid, morphine and creosote preparation, and to be free from any undesirable qualities.

To Roughen a Smooth Broach.—*Items of Interest* suggests the barbs on the broach we buy occupy as much space as the broach itself, so that it will not enter many of the delicate root canals. Take an untempered, smooth broach, or form one from fine piano wire, and draw a sharp separating file lengthwise of the broach, which will assist to catch the pulp in the root canal. It is also good to hold cotton twisted around it.

To Bronze Tin and Tin Alloys.—Tin, and tin alloys, after careful cleansing from oxide and grease, are handsomely and permanently bronzed if brushed over with a solution of one part of sulphate of copper (bluestone) and one part of sulphate of iron (copperas) in twenty parts of water. When this has dried, the surface should be brushed with a solution of one part of acetate of copper (verdigris) in acetic acid. After several applications and dryings of the last named, the surface is polished with a soft brush and bloodstone powder. The raised portions are then rubbed off with soft leather moistened with wax in turpentine, followed by a rubbing with dry leather.

What are the Duties of a Dentist?—Dr. John H. Coyle, of Thomasville, Ga., says, in the *Archives of Dentistry:*

The arrest of caries by filling or otherwise,
Extracting teeth and controlling hemorrhage,
Regulating teeth,
Treating and filling root canals,
Treating odontalgia,
Prevention and cure of alveolar abscess,
Removal of salivary calculus and cleaning teeth,
Treating diseased gums,
Restoring lost teeth.

The above belongs to the work of the dentist. Anything beyond that belongs to the domain of the physician or the oral surgeon.

The Hairs of our Head Numbered.—A German inquirer has, it is stated, taken four heads of hair, of equal weight, then proceeded to count the individual hairs. One (red) was found to contain 90,000 hairs; another (black), 108,000; a third (brown), had 109,000; and the fourth (blonde), 140,100

A Convenient and Certain Mode for Tempering Steel.—Mr. James A. Peck, of Brewsters, N. Y., mechanical engineer for the N. Y. Condensed Milk Co., gives us the following method discovered by him, and which he uses with great success for tempering all kinds of tools, knives, razors, steel dies, and other implements.

Take a suitable quantity of muriatic acid; dissolve all the zinc the acid will take. Prepare a tempering bath composed of one part of the above zinc-acid and one part water. Heat the steel according to its hardness. If high or hard steel, heat until just red and then temper in the acid bath. If low steel, heat it as hot as you would to temper in water, then temper in an acid-bath. After immersing in the acid-bath, cool off in water. For lathe and planer tools draw no temper; but for other tools draw temper. Unlike water tempering, the colors that appear under this method give no clue to the hardness.

By this process, steel is readily hardened to any desired degree, and may be made to cut glass like a diamond. If desired, an acid-bath composed of two parts of muriatic acid and one part water may be used. Mr. Peck, however, prefers the zinc-acid as being more dense.

A prominent advantage of this method of tempering is the certainty of its results. It never fails to yield the temper required. It can be relied upon for every description of steel or tool.—*Scientific American.*

KEEPING LEMONS.—Professor Remington states that a solution of table salt about the density of sea water will be found effectual for their preservation for five or six weeks at a time; before the juice is expressed, the lemons are well washed with water.—*Am. Journal Pharmacy.*

Heat red or white gutta-percha upon a porcelain disk or slab until sufficiently soft to be kneaded full of zink fillings; this will make excellent temporary fillings.—*Archives of Dentistry.*

DR. BOWMAN MACLEOD says that plaster-of-Paris mixed with ordinary water will not only expand on setting, but warp; thus causing many imperfect models. To avoid this he advises mixing the plaster with water to which potash alum has been added, in the proportion of three or four ounces to the gallon, which will do away with the unequal expansion, and consequent warpage, of the plaster.

Dr. J. S. CASSIDY: Aseptol covers a larger field than any of the substances of which it is formed. In regard to cocaine, if a good preparation is used it is always effective to a certain extent, but by taking 1 drachm of camphor and 1 drachm of chloral and adding ½ ounce cocaine alkaloid and 2 drachms sulphuric ether, you get an obtundent that will act every time. A five per cent. aqueous solution is beneficial for swellings, such as those caused from abscessed teeth, etc.

Local Anæsthetic.— Dr. Kulp, of Davenport, Iowa, uses the following formula:—

Olei Caryophill.
Olei Cinnamom.
Chloroformi, in equal parts.
Apply with cotton upon the gums.

Ready-Made Glue.—Dissolve 1 ounce best glue in 4 ounces acetic acid; add 1 ounce glycerine and 5 drops of nitric acid. This glue keeps well and is always ready for use.

Dr. Pierre's Dentrifice.—In further reply to an inquiry in our last number, we give a formula for a preparation resembling this, which has been printed in the *Pharm. Rundschau*:

Ground star anise seed	6 oz.
Powdered cochineal	½ dr.
Alcohol	3 pints.

Percolate the solids with the alcohol, and in the percolate dissolve:

Oil of star anise seed	1 ½ fl. oz.
Oil of peppermint	½ fl. oz.
Heliatropin	1 gr.

Let stand several weeks to ripen.

Glass Stoppers in Bottles.—A. J. G., Grand Rapids, O., recommends smearing a little petrolatum on glass stoppers, to prevent them from becoming stuck in the necks of bottles.

Silvering Brass Without a Battery.—G. D. M., Sloan, Ia.—Try the following:

	Parts.
Nitrate of silver	80
Chloride of ammonium	40
Hyposulphite of sodium	160
Distilled water	36

Dissolve the nitrate in the water; then add the other salts. Finally, add to the solution a little finely-levigated whiting. Thoroughly clean the object before applying.

A similar solution is made from cyanide of silver, but is objectionable on account of its highly poisonous character, and consequent danger in handling.

LAKE ERIE DENTAL ASSOCIATION.

Complete Proceedings of the Twenty-Fourth Annual Session, Held in Meadville, May 3-5, 1887.

The twenty-fourth annual meeting of the Lake Erie Dental Association convened at the Commercial Hotel, this city, commencing at 11:20 a. m., Tuesday, May 31, when the meeting was called to order by President Green who occupied the chair.

The following members answered present at the first roll call:

Drs. George Elliot, Cyrus See, Meadville; C. D. Elliot, Franklin; G. W. Green, New Castle; J. A. Todd, Titusville; W. E. Van Orsdalen, Sharon. During the day the following additional members arrived: T. H. Whiteside, Youngstown; H. C. Dunn, Meadville; E. R. Allen, Girard; J. H. Nelson, North East; W. B. Isenberg, Mercer; M. H. Fetzger, Greenville; D. D. Magill, Erie; E. M. Wolf, Oil City. The following visitors were also present: F. H. Abel, Erie; J. W. Lyder, Akron; W. C. Mason, Mercer; F. H. Heivly, Oil City; F. Herrick, Greenville.

On motion the order of business was so changed as to bring the President's address the first thing of the afternoon session.

After approving the minutes of the previous meeting, as read, the executive committee recommended that the hours of session be from 9 a. m. to 12 m.; and from 2 to 5. p. m. Adopted.

Request of Dr. H. L. Wilkins, of Waterford, for withdrawal card, granted.

AFTERNOON SESSION.

Meeting called to order at 2 p. m.

President Green delivered the annual address, in which he treated the association to a very able discourse on their duties to their profession, to society and to the association.

On motion visiting members were extended the courtesy of the floor.

Report of Drs. Heivly, Van Orsdalen and Green, delegates to the State Society, read.

Dr. D. C. Dunn read an interesting paper on "Care and Treatment of Deciduous Teeth." Discussion by Drs. Wolf, Abel and Heivly followed.

Dr. D. D. Magill, of Erie, followed with an interesting paper, which brought out a long discussion, participated in by several members. The subject, the "Pyorrhœa Alveolaris," and the time occupied in its discussion brought the session to the hour of adjournment.

In the evening the association went into a Committee of the Whole, the discussion being of a general nature and not entered on the minutes as part of the proceedings.

SECOND DAY.

Minutes of previous session approved as read.

Drs. W. C. Mason, Mercer, and F. H. Abel, Erie, were elected to membership.

Request of Dr. E. R. Allen, Girard, to be allowed to retire from active membership and be placed on the honorary list, granted.

Motion of Dr. See to increase the salary of the Secretary to $25 per year carried.

Dr. See stated that in Vol. 1, No. 3, of the *Dental Review*, published in Chicago, the following "query" was published:

"To the Editor of the *Dental Review*, Sir:—I wish some advice about the treatment of the antrum. I have a case where an abscess from the second bicuspid discharged with the antrum, and after the extraction of the root, pus continued to flow from the opening. What treatment should be adopted? D. D. S., Meadville, Pa."

Dr. See further stated that he had written to the *Dental Review*, asking for the name of the correspondent, if the communication was genuine, and it not genuine, that a statement be published in the next number stating that the query was not written by any one entitled to the degree D. D. S., residing in Meadville, Pa. A reply was received stating that the communication was not genuine, and that the editor declined to make any amends for the injustice done.

Dr. See asked that a committee of three be appointed to examine the publication and the correspondence between himself and Dr. A. W. Harland, the editor, on the subject, said committee to report by resolution or otherwise, as the question demands.

On motion of Dr. Heivly, the president appointed Drs. Wolf, D. D. Magill and Todd as said committee.

The topic, "Crown and Bridge Work," was spoken on by Dr. J. A. Todd, Titusville.

The Committee on Enforcement of Dental Laws reported that but one case of violation had come to their notice.

AFTERNOON SESSION.

Roll called and minutes of morning session approved as read.

The following was read:

We, your committe appointed to take into consideration the matter complained of by our fellew member, Cyrus See, D. D. S. of the publication in the *Dental Review,* in Vol. 1, No. 3, Page 165, and signed D. D. S., Meadville, Pa., find it was not a communication from any one, but originated in the office of the *Dental Review*. We find the matter complained of, from the evidence presented, to be true; and therefore, we wish to offer the following:

WHEREAS, Dr. See feels aggrieved by said publication and has written to the editor of said journal, and the reply received from said editor is of so evasive and unsatisfactory a nature, that we deem it but justice to Dr. See and the profession at large, that the facts in this case be made public. Therefore,

Resolved, That the publication of the query in question was an act unprofessional toward a brother dentist, and beneath the dignity of respectable journalism, and that the secretary furnish a copy of this report to the dental journals for publication.

E. M. WOLF,
D. D. MAGILL, } Com.
J. A. TODD.

The Executive Committee, having examined the accounts of Dr. Allen, as treasurer, report to wit:

Received as per last report, - - - - - - -	$102 28
Paid as per vouchers (since burned) expense in full of litigation in case Dickson, of Sharon, - - - - -	48 32
Balance on hand, - - - - - - - - - -	$ 53 96

This amount is now in the hands of your Executive Committee.

Respectfully Submitted,

CYRUS SEE,
J. H. HEIVLY,
M. H. FETZGER,
M. B. NARAMORE,
Executive Committee.

Received and adopted.

Charges were preferred against Dr. F. H. Lawrence, of Erie, and the Secretary instructed to notify him to appear at the meeting of the association and show cause why he should not be expelled for breach of the code of ethics.

The following officers were elected:

Dr. Fetzger, President; Dr. Naramore, Vice President; Dr. Elliott, Secretary; Dr. Heivly, Treasurer. Board of Censors: Drs. Whitesides, Green and See. Delegate to State Society, Drs. See, Fetzger, Elliott, (C. D.) Abel and Dunn.

The following was adopted:

Resolved, That as our next meeting will be the quarter centennial of this association, a more general invitation be given to the profession to meet with us on that occasion.

Meadville was selected as the place for holding the next meeting.

Adjourned.

CLOSING SESSION, THURSDAY.

Meeting called to order at 9:30, roll called and minutes of previous meeting approved as read.

The subject of electricity, as applied to dentistry, was freely discussed and productive of numerous opinions, some being strong admirers of the electric mallet.

Dr. George Elliott read an interesting paper on "Constitutional Treatment of Teeth of Frail Structure." The article was very lucid, hence well received. In the general discussion that followed, Dr. F. H. Abel, Erie, spoke at some length and advocated the filling of such teeth, temporarily, with zinc phos; he also described cases in practice in which he had given constitutional treatment and from which he hoped for beneficial results.

Secretary's report of receipts and expenses, showing a balance of $94 in the treasury, was read and approved.

The newly elected officers were introduced and installed into their several positions. Remarks were in order and the newly elected acquitted themselves in a manner highly pleasing to the members.

The president announced the following as the executive committee for the ensuing year: Drs. Cyrus See, George Elliott, F. Herrick, E. M. Wolf, F. H. Abel.

The executive committee reported the following as subjects and essayists for the next session:

Address of Welcome, George Elliott, Meadville.

President's Address, M. H. Fetzger, Greenville.

Anæsthetic Application of the Dental Art, W. E. Magill, Erie.

Discussion opened by J. A. Todd, Titusville.

Remedial agents and their Application in Dental Practice, W. E. Van Orsdalen, Sharon.

Discussion opened by E. M. Wolf, Oil City.

The practical Application of Crown and Bridge Work, F. H. Abel, Erie.

Discussion opened with clinic, by T. H. Whitesides, Youngstown.

The Matrix and its uses, G. W. Green, New Castle.

Discussion opened by J. H. Heivly, Oil City.

Enology of Dental Caries, W. C. Mason, Mercer.

Discussion opened by D. C. Dunn, Meadville.

Electricity as Applied to Dentistry. H. E. Dunn, Cochranton.

Discussion opened by F. Herrick, Greenville.

Incidents of Office Practice, Discussion General.

The committee also recommended a four days' session, which, with the balance of the report was adopted.

On motion the secretary was instructed to send each member of the association a paper containing a full copy of the proceedings of the meetings.

The following resolution was adopted:

Resolved, That the thanks of this association are heartily tendered to Mr. Martin, proprietor of the Commercial Hotel, and to the representatives of the press for the kindness and attention shown this association during this meeting.

There being no further business, the meeting adjourned *sine die*, and thus ended one of the most interesting sessions in the history of the Lake Erie Association. The attendance was not only large—some thirty members and visitors being present—but the meetings were full of profit for all concerned. The next—the quarter-centennial—meeting, will be held in this city, four days, commencing the first Tuesday in May, 1888. Every effort will be put forth to make it the most important in the history of the association, and one which will fittingly commemorate its quarter-centennial anniversary.

DENTAL SUGGESTIONS.

BY JOHN D. WINGATE, D. D. S.

The difference in the effect of hand-pressure, as compared with malleting, is easily shown on a heavy piece of lead. The mallet-stroke will sink the plugger-point much deeper into the lead than will hand-pressure. From this standpoint the value of mallet instruments may be estimated.

At the eighteenth annual meeting of the First District Dental Society of New York, there was a fine display of instruments, among which were some mallet-pluggers. The writer disgusted the exhibitor of a mechanical mallet not a little by trying his noisy instrument with pressure, when it stopped hammering. In the estimation of the writer, such an instrument is worthless. It will give only surface condensation unless the blow is made unpleasantly heavy for the patient, who may be deemed to be entitled to some consideration.

The amount of greasy matter which is absorbed by porcelain teeth when worn for a time, is surprising. Even a gold plate, after a few years' wear, becomes so impregnated that a piece half an inch square will give off an unbearable odor when heated. The ground surfaces at the joints between gum-sections are soon covered with this greasy deposit. When the plate is worn, and when repair is necessary, the vulcanizing process seems to char it: making dark, disgusting looking joints. If the blocks are removed from the plate and boiled for an hour in a solution of bicarbonate of soda, they will be thoroughly cleansed from grease. The blocks may be removed from the plate by heating it. A plaster model should first be run on its palatal side, to prevent warping. After the blocks are removed, the edges of the fracture—if the plate is broken—are easily cut away, to secure fresh surfaces for the new rubber to adhere to, and if sufficient of the old rubber is removed to allow the new material to reach the pins in the blocks next the fracture, a very strong joint will be made.

In mixing plaster-of-Paris, if as much sugar as will lay on a silver five-cent piece is added to the water used, the cast will be found to be surprisingly hard, even if the plaster should be poor. For quick setting, both sugar and salt may be added. The addition of alum or cream of tartar will retard its setting.

If a coil of sheet zinc is put into the water in a vulcanizer, it will prevent the formation of much of the black oxide which is found on iron flasks and clamps. After the zinc has been used three or four times, the flasks will soil the fingers but very little when handled.

Partial impressions should be well flooded with water just before the plaster is poured. The plaster should be mixed considerably thicker than usual, as the water left in the impression will mix with it and render it thinner. After the impressions of the teeth are filled, pieces of wire may be dropped into them to strengthen them. A cast from a well-drenched impression will show but few, if any, air bubbles, as the water leads the plaster over the surfaces and into the depressions.

BLEACHING TEETH.

There are many methods of performing this every-day operation; some are good and others very bad. Teeth may be bleached with hot air, by electricity, with peroxide of hydrogen, but no single method can be used satisfactorily for all cases. A correspondent desires some information on this subject, and we present the following as one method:

After the root has been filled, and the tooth is free from tenderness, apply the dam, dry the cavity, and remove all discolored decay. Wash the cavity several times with fresh peroxide of hydrogen, and place a few crystals of chloride of alumina in the cavity (this may be procured of E. H. Sargent & Co., Chicago), moisten them with peroxide, and wait from three to five minutes, wash the cavity thoroughly with distilled water, then apply a solution of thirty grains of borax to the ounce of water, until the acid is entirely neutralized.

Dry the cavity with hot air, and paint the interior with copal ether varnish. When it is dry, mix oxychloride of zinc of the desired color, and fill the cavity full; allow it to harden, then prepare the cavity for the gold filling, and fill it at once. It will be noted that the whole operation is to be made at one sitting, and that oxyphosphate of zinc is not recommended as a lining for the cavity, or base for the gold filling. In the central and lateral incisor teeth we have glued white unruled note-paper to the labial walls with varnish, then covered it with oxychloride, and afterwards filled with gold, and had a good result as regards color. A cause of failure is the performance of the operation on different days, thereby allowing moisture from without to gain entrance to the cavity, and contaminate the oxychloride. Never use a steel instrument when mixing it, and always allow the water of crystallization to be seen on the surface before cutting into it. Follow these procedures, and you will be surprised at the results.—*Editorial in Dental Review.*

DON'T READ THIS.

Messrs. JOHNSON & LUND:—

Gentlemen:— * * * * * * * I must confess my regrets that I did not know the true inwardness of your "EXTRA TOUGH" Dental Rubber ere this time, and am really sorry I did not take your advice long since, as with the extra tough rubber, treated according to directions, I can make plates almost as thin as gold plate, and much stronger than with any other rubber I have used of three times the thickness, and find that it takes kindly to the mouth and causes no irritation. You are at liberty to use this if you wish. Hastily, &c.,

E. D. WILLIAMS, D. D.,
Wilkesbarre, Penna.

MY METHOD OF BRIDGE-WORK.

BY H. W. RUNYAN, D. D. S., EATON, OHIO.

There is no doubt that bridge-work is very valuable in many instances, for partial dentures. But the great cost of the gold process places it within reach of comparatively few, while there are fewer practitioners of dentistry that thoroughly understand the swaging and soldering of gold that is necessary in the construction of the gold bridge-work. The method here described will place it within the reach of all who can afford a plate of any kind, and it can be constructed by any one capable of making a vulcanite plate, and I think it will last as long as any bridge-work, or as long as the roots, to which it is attached, will last.

Process of Construction, for a case where the four incisors are missing and the cuspid roots remain:

After cutting the cuspids down to, or a little above, the margin of the gum, prepare by drilling out the canal with an inverted cone-bur, and then a pointed fissure-bur. By so doing a perfect funnel-shaped canal is formed, which gives strength to the work, and facilitates access to the end of the root. Take a platinum bar long enough to reach from one root to the other, and bend at right angles to form the pins. Now set the bridge support in place, after bending to conform with the gums; and take the impression and articulation. Make the model, place on the articulator, and wax on vulcanite teeth. Remove from the articulator, flask and vulcanize, after covering all the rubber with vulcanizable gold.

Gum teeth can be used for the bridge between the roots, if the alveolar process has been absorbed very much.

After vulcanizing, clean up and fasten in by placing a little cement on the pin that extends into the cavity formed by the fissure-drill. The rubber will fill that part formed by the inverted cone.

Use the best rubber, run the vulcanizer slowly up to 300° Fah. and vulcanize for one hour and fifteen minutes. You will have "a thing of beauty, and a joy" to your patient and yourself.—*Ohio Journal of Dental Science.*

PENNSYLVANIA STATE BOARD.

The State Board of Dental Examiners will meet, with the State Dental Society, at Glen Summit, Luzerne County, Tuesday, July 26th, 1887.

Candidates for Examination should be prompt in attendance, and call upon the Secretary, Dr. J. C. Green.

N. E. MAGILL,
President.

AMERICAN DENTAL ASSOCIATION.

CHANGE OF PLACE OF MEETING.

The Twenty-Seventh Annual Meeting of the American Dental Association will be held at Niagara Falls, commencing Tuesday, August 2d, 1887.

GEO. H. CUSHING,
Recording Secretary.

times the flasks will soil the fingers but very little when handled.—*Dental Advertiser.*

VERATRINE AS AN OBTUNDENT OF SENSITIVE DENTINE.—Dr. Bogue (New York) recommends a certain amount—about a grain—of veratria, which will dissolve in about three drops of alcohol. To that put sufficient tannin to saturate it, and then add ten drops of glycerine. It will of course be understood that this remedy must be applied when the dam is in place and the teeth perfectly dry, as it is exceedingly poisonous. One-fiftieth of a grain is a dose. After being in the tooth ten minutes I wash the cavity with alcohol, dry it thoroughly, and find I am able to excavate with little pain.

GOLD AND SILVER SOLDERS.—The process of formulating and compounding an alloy with which to form gold and silver solders, develops what seems to be a fact, that pure zinc—*i.e.*, free from arsenic, antimony, cadmium, etc.,—will not render gold brittle. Take of chemically pure metals, silver, one part; zinc, two parts; copper, three parts. Melt the copper in a clean borax-lined crucible, add the silver, then the zinc in small portions, with constant stirring with a clay rod. When the denser fumes of the burning zinc pass off, pour from a hight into water, or pour into an ingot mold. The resulting "solder alloy" may be used in the place of the metals usually employed in connection with gold and silver for gold and silver solders, with the following results: The solder will follow and retain the color of the plate used, and will be tough and free from brittleness. The usual method of employing this alloy is to take from four down to two parts of either gold or silver (as gold or silver solder is desired) to one of the alloy, melting together under borax with agitation, rolling to the desired thickness, aud marking on one end the carat of the gold used (if gold) and also the proportion of gold, as for instance 20 (20 carat gold), 3 (3 parts gold). The solder formed by the use of this alloy is easily made, easy flowing, and as strong as the plate from which it was made.

SIMPLE TEST FOR GOLD.—Take a piece of flint and rub against it the metallic object to be tested, until the latter leaves a sufficiently marked trace upon the stone. Upon bringing the flame of a sulphur match in contact with the spot, the latter will remain intact if it has been made with gold, but will disappear if the contrary be the case.—*La Science en Famille.*

AN EXCELLENT PICKLE for gold work may be prepared from the following formula: Oxalic acid, ½ oz.; sulphuric acid, 1 oz.; water 6 oz.—*Ind. Pracr.*

ALUMINUM SOLDER.—Twenty parts of aluminum, 80 parts zinc. Melt the aluminum, then add the zinc with a little fat; stir this with an iron rod and pour in molds. Another formula is aluminum 90 parts, tin 10 parts.

NEW LOCAL ANÆSTHETIC. — A crystalline substance has been obtained in minute quantities from the rind of pomegranates, which when placed on the tongue or other portions of the mucous membrane paralyzes local sensation after the manner of cocaine.—*Pacific Record.*

TO HARDEN PLASTER.—Dr. Wingate advocates dissolving a little sugar in the water before mixing plaster, claiming that the cast will be much harder. Also the placing of a small piece of sheet zinc in the vulcanizer to prevent the formation of the black coating found on iron flasks and clamps.

AMALGAM FINISHER.—In many places a narrow strip of rubber dam, used as a tape, will serve admirably for the purpose of smoothing down to the borders and polishing amalgam fillings on proximal surfaces of the bicuspids and molars, and is especially good for removing any particles that may adhere to the gum between the teeth.

ROOT CANAL DRYER.—One of the latest and best inventions for use in dentistry has recently been gotten out by Dr. J. H. Woolley, of Chicago. It is a root canal dryer, and consists of a handle, similar to that of a plugger. To the end of this is screwed a cone of copper to which a copper broach of any size can be attached. The cone is heated in the flame until quite hot, then the instrument is ready for use; the heat being steadily conducted from the cone to the end of the broach. With it a root can be thoroughly dried to its apex. The instrument acts also as a disinfectant, destroying, as it does by heat, any microbes within the cavity. It has been highly indorsed by prominent dentists.

WATT'S METAL makes an excellent die for striking up gold-crowns by Dr. Melotte's method, using the Melotte metal for the counter.

PUMICE CARRIER.—Dr. G. B. Clement says, take any shape wood point and, when inserted and revolving in the engine, wrap it tight with a piece of absorbent cotton. This dampened makes a splendid carrier of pumice stone or powders.—*Southern Journal.*

WASHING OUT THE STOMACH.—This operation, such a novelty a few years ago, is coming quite in vogue. A Maryland doctor employs the method very extensively in cases of dyspepsia. The following is the *modus operandi*: A soft red rubber tube is passed gently down into the stomach, quite to the pylorus; with this is connected about a yard of common flexible tubing and a glass funnel, which is held on a level with the patient's breast, and tepid water is poured slowly into the funnel until a sensation of fullness is experienced. The funnel is then depressed to the level of the waist, and the fluid allowed to siphon out. The process is repeated until the water returns quite clear.

AN ETHERIAL SOLUTION of Tannin, of syrup consistence, is said to be the best application to burns. It immediately soothes the intense pain, dries rapidly and forms a pliable, non-elastic coating which is preferable to collodion, because it does not shrink and become stiff.

FACTS ABOUT THE HUMAN BODY.—The skin contains more than two million openings, which are the outlets of an equal number of sweat glands.

The human skeleton consists of more than two hundred distinct bones.

An amount of blood equal to the whole quantity in the body passes through the heart every minute.

The full capacity of the lungs is about three hundred and twenty cubic inches.

About two thirds of a pint of air is inhaled and exhaled at each breath in ordinary respiration.

The stomach daily produces nine pounds of gastric juice for the digestion of food ; its capacity is about five pints.

There are more than five hundred separate muscles in the body, with an equal number of nerves and blood vessels.

The weight of the heart is from eight to twelve ounces. It beats one hundred thousand times in twenty-four hours.

Each perspiratory duct is one-fourth of an inch in length, which will make the aggregate length of the whole about nine miles.

The average man takes five and one-half pounds of food and drink each day, which amounts to one ton of solid and liquid nourishment annually.

A man breathes eighteen times a minute, and three thousand cubic feet, or about three hundred and seventy-five hogsheads of air an hour.

PHYSICIANS' BILLS.—Miss Wolfe, owner of $10,000,000, who lately died paid Dr. William Todd Helmuth $5,000 a year to doctor her. Mrs. Alexander T. Stewart retained three doctors at an aggregate cost of at least $40,000, and called in one of them nearly every day. Mrs. William Astor pays to Dr. Fordyce Barker annually an average of $20,000, always sending a check for double or treble the amount of each bill rendered. Her idea is that by rewarding his skill and vigilance liberally she will get the very best service of which he is capable. Mrs. Cornelius Vanderbilt's physician is Dr. W. S. Belden, and although her health is excellent he is consulted often, prevention being preferable to cure, doubtless, and the belief is that the prevention costs not less than $10,000 annually. [And yet the large majority of patients complain of extortionate dental bills.—*Ed.*]

A New Source of India Rubber.—According to the *Bulletin de la Societe Chimique de Paris*, the Sonchus oleaceus, a plant which grows wild in France in dry places, along roads and among rubbish, has been found to contain india rubber. This is extracted by treating the plant with bisulphide of carbon, and boiling the extracted substances with alcohol. The mass is then heated with alcoholic potash, and washed several times with warm diluted alcohol. This removes all greasy and waxy matter, as well as chlorophyll. The residue is elastic, and presents all the characteristics of indiarubber. It dissolves entirely in bisulphide of carbon and in chloroform, and partly in ether.

Vinegar and Digestion.—According to *Good Health*, experiments have shown that even so small a quantity of vinegar as one part in 5,000 appreciably diminishes the action of saliva upon starch. One part in 1,000 renders it very slow, and twice the latter quantity arrests it altogether. From this it is evident, says our contemporary, that vinegar, pickles, salads and other preparations in which vinegar is used are unwholesome, especially when taken with farinaceous food, such as bread and other grain preparations.

Effects of Bitter Extracts on Digestion.—Dr. Cheltsoff (*Lancet*) has been making experiments with a view of determining the true action of bitter extracts upon digestion. The drugs tested were the ordinary bitters—quassia, cascarilla, columbo, gentian, etc., and the deductions were briefly as follows: Bitter extracts, even in moderate doses, interfere with gastric digestion. In large doses they diminish the secretion of gastric juice; small doses may cause a temporary increase, but they diminish its digestive power. Bitter extracts do not affect the pancreatic secretion, but they do retard the further process of digestion which proceeds below the pyloric orifice. They affect the flow of bile either not at all or only slightly. They impair the assimilation of nitrogenous food.

Boric Acid as a Local Anæsthetic.—Dr. A. C. Ewing reports in the *Am. Practitioner* a case in which boric acid was found to exert decided anæsthetic properties when used as a local application. The patient was suffering from a deep suppurating wound in the palm of his left hand. Thirty grains of boric acid was dissolved in a half-ounce of water and a pad of absorbent lint was saturated with the solution and applied to the wound. When the patient reported next day, the doctor was "agreeably surprised to find that he had not suffered in the least during the night." The same dressing was continued, and the wound healed rapidly by granulation.

THE PHYSICAL PROPERTIES OF VULCANITE.

BY GEORGE B. SNOW, D. D. S., BUFFALO, N. Y.

India-rubber, when vulcanized, undergoes very considerable changes in its mass, as follows:

In expands with great force, and at a rate over six times greater than that of iron, when subjected to heat.

When hardening, it contracts; increasing in specific gravity, and showing its contraction by a change in shape of its mass: flat sides becoming concave, and convex sides being distorted and flattened; the action being most evident in its thicker portions.

After it is vulcanized, it undergoes contraction by cooling to a greater extent than most other bodies.

The extent and force of the expansion of rubber, when subjected to heat, render it imperative that when it is packed in a mold and vulcanized, as when a dental plate is formed, a full and free escape should be provided for surplus rubber, and for its increase in bulk by expansion. This is usually done by cutting grooves or gateways extending from *the mold* (which term will be here used to denote the cavity which is packed with rubber to form the plate) across the parting-face to the edge of the flask. (The term "parting-face" is applied to the opposing surfaces of plaster outside the "mold," which come in contact when the flask is closed.)

A reference to the engravings used as illustrations in books giving instructions for making vulcanite plates, will show this parting-face scored with radiating grooves, with possibly one circumferential one, dividing the space between the mold and the flask; thus leaving a considerable portion of the face to come into close contact with its counterpart. When the fact was taken into consideration, that rubber is excessively viscid, flowing only slowly and with considerable difficulty, and that when it once finds lodgment between two surfaces it is impossible to expel it wholly by any reasonable amount of pressure, it will be evident that the remaining surface of the parting-joint will form a serious obstacle to the complete closure of the flask. Inspection of a plate as it is removed from the flask after vulcanizing, will usually show it surrounded by a "fin" of rubber, and the articulation of the plate will be faulty by the amount of thickness of this "fin," which can only be present, under the usual circumstauces, when the flask was incompletely closed.

The whole surface of the parting-face should be removed, except, possibly, a narrow margin, not over one-eighth of an inch in width, next the mold, by a cut extending entirely around the mold and gradually increasing in depth towards the flask. The escaping rubber will then be entirely free as soon as it passes the margin; and if this is scored at intervals, so that the rubber may still find vent, as it expands by heat, the flask may be closed more perfectly and a closer articulation secured than if a large portion of the parting-joint is left intact. It may, indeed, be well to also remove a little from the surface of the margin; enough to allow for the "fin" of rubber, which will always be found if there has been any escape from the mold, and which, thin as it is, denotes a slight disturbance of the articulation of the plate. Very little thought is usually given to the matter of cutting gateways; but if they are insufficient, or if so much rubber is used as to fill them, its force of expansion will inject the joints with it, darkening them, and will sometime crack section teeth or force them out of place.

Much damage is done by haste and the exercise of undue force in closing the flask. Sufficient time should be taken to allow the rubber to accommodate itself to, and to move before, the pressure applied to it. The few extra minutes required to do the work easily will be time well spent.

The following points should always be attended to in making vulcanite plates, to insure good results:

1.—If section teeth are used, let them be thoroughly cleansed of wax. See that the rim of the plate does not overhang the edge of the gum at any point. If there should be a coating of wax upon the surface of the teeth, the plaster investment could not be brought into close contact so as to support the section properly, and it may be cracked by the pressure used in closing the mold. If the rim overhangs the gum, it may be broken by contraction of the rubber in cooling, as will be explained further on.

2.—In fitting the joints, they should be so ground that the surfaces of contact will bear squarely upon each other. If the bearing is only at the front edges of the joints, the contraction of the rubber in cooling will draw the sections together with such force as to oftentimes chip off little pieces of the face of the gum, forming a serious disfigurement. To prevent dark joints, fit them as closely as possible, always keeping the ground surfaces absolutely clean, and making a slight bevel on their inner edges. Before waxing up, cover the outer edges of the joints with oxy-phosphate of zinc. This is to be applied not *in* the joints, but to the gum surface—the section being in place—to prevent dirt working into the joints from the outside. The oxy-phosphate may be colored, to imitate the gum-color, with a red pigment, preferably with iron as a basis, *e. g.:* Jeweler's rouge, or Indian red. Red lead, for instance, would blacken from chemical action in vulcanizing.

3.—After the flask is filled, let it stand before proceeding to pack it, until the plaster is thoroughly hard; waiting, if possible, some hours. It may be opened and made ready in the meantime, but pressure should not be brought upon the plaster until it is abundantly able to bear it without yielding.

4.—Warm the flask, before attempting to open it, by immersing it for a few minutes in *warm*, not hot, water. Remove the base-plate, and rinse the mold thoroughly with a stream of *boiling hot* water.

5.—Twist a very few fibers of cotton wool into a thread, and pack the beveled openings at the inside of each joint, fastening each end of the cotton into the plaster above and below with an excavator, and carrying the cotton well into the grooves; using not enough to entirely fill them. The mistake is often made of using too large a thread. Instead of packing the joints with cotton, as above described, they may be cemented with oxy-phosphate of zinc, colored to imitate the gum.

6.—With a scraper, cut away *all* the parting-face entirely around the mold on one part of the flask, preferably the lower or mold side, leaving only a narrow rim next the mold, and scraping this slightly

Let the cut deepen gradually, so that it will be nearly one-eighth of an inch in depth next the edge of the flask. Cut notches at least one-sixteenth of an inch deep at intervals half an inch apart into the cut just made, leading into the mold.

7.—Paint the plaster surfaces of the mold (both palatal and lingual sides) with a *thin* coating of Liquid Silex, wiping off any surplus with a pledget of cotton. Do not allow any of the silex to touch the teeth or pins, and let the coating dry before packing the mold. It is usual to coat the model, either as above described, or with tin foil. It will be found advantageous to apply the silex to the lingual surface as well, as the unprotected plaster unites with the rubber, and—especially if black rubber is used—the result is a hard, white crust, covering the plate, which is very destructive to the edge of the scraper. If the silex is applied, the plate leaves the mold with a clean surface, easily finished.

8.—Ascertain the exact quantity of rubber necessary to fill the mold. Guess-work is bad practice. If the base-plate is made of wax, weigh it, and use four or five grains more than twice its weight of rubber. If the ordinary balance is used, the wax can be added to the weights, after weighing it, to give the weight of rubber required, using as surplus, a piece as large as the finger-nail. If the base-plate is made of other material than wax, its bulk can be ascertained by displacement, the Woodard Rubber Gauge being a very convenient instrument for the purpose. An approximation can be made by throwing the base-plate into a tumbler of water, noting the height of the water exactly, removing the base-plate and dropping in slips of rubber until the water stands at exactly the same point as before. If there are very thick places in the plate, pieces of old vulcanized rubber may be put in with the rubber gum, when its weight or bulk is ascertained, and these pieces used in conjunction with the vulcanized gum, to pack the thick parts. They should first be tried and fitted to the places they are to occupy, and should be *freshly filed* all over, and be thoroughly clean.

9.—The rubber should now be warmed enough to soften it, by putting it on a warm dish, and the mold carefully packed; putting in the rubber so that it will be moved as little as possible when the flask is closed. Place the two parts of the flask together and insert the bolts, screwing them up lightly. The flask must now be heated to insure plasticity of the rubber. This is best done by boiling it in water. When it is hot, screw down the bolts slowly and evenly, passing from one to the other. Take plently of time and use as little force as possible. When the flask is closed, it is ready for the vulcanizer.—*Dental Advertiser.*

MAKING DIES WITHOUT MOULDING IN SAND.

The following extracts from an article, by Dr. F. Y. Clark, on a "New Method of Making Dies," in Vol. I of *Dental Cosmos*, will be of special interest at this time, because metal plate-work is becoming more popular every day among the best operators. The article is unusually valuable in making metal dies for bridge work.

Without referring to the advantages enumerated by Dr. Clark, we give the article from the point where he indicates the process.—*Ed.*

"To commence, it is necessary to have an impression cup made from brass, German silver, copper or any other metal that will stand the necessary amount of heat for obtaining a metallic die without change; we prefer one made from copper, because this metal is more malleable and easily cleansed after using, than any other that we have tried. It should differ in no other respect from the ones in general use, except in the perforation of holes all over its surface, about one-fourth of an inch apart and one-eighth of an inch in diameter. These holes are very essential, for they not only prevent the material from leaving the cup in removing it from the mouth, but greatly facilitate the escape of moisture in drying, or on receiving the metal for the die. With a cup as described we use a batter composed of equal parts of clear white spar, and the best calcined plaster of Paris. The manner of taking an impression with this batter is nearly the same as with plaster alone. It should be mixed somewhat thicker at first than plaster batter used for the same purpose, and kept in constant motion until there are unmistakable signs of its setting, and then conveyed to the mouth as quickly as possible. We think only a little experience is all that is necessary to convince anyone that there are few cases, if any, where a better impression cannot be taken with this mixture than with either plaster or wax. The impression when taken should be placed in a flask, three-fourths of an inch deep, made from gray iron with a large open space in the bottom, leaving only a rim on the inside large enough for the impression cup to rest upon. This open space is for the escape of moisture coming from the holes in the cup as before described. The space between the impression and the flask should now be seamed up with a batter a little thicker than that used for the impression; it should be spread so as to prevent running down between the cup and the rim of the flask: use just enough batter to hold the cup in place and give a smooth continuous surface to the parts. The flask and impression thus prepared are now ready for the second flask about two and one-half inches deep which is placed around the first. The whole should now be placed in an oven or on a stove, or any place where it will dry; this can be done either rapidly or gradually; when we are in a hurry we generally have it dry by the time the metal is melted, but it may be better to give it more time. It is not my wish to say anything here about metal; almost every dentist has some peculiar favorite of his own; of course it is immaterial what kind is used in this process. After the metal is poured and when the die has become sufficiently cold it should be next removed from the impression, and flask No. 2 placed around it as before, then inverted, and the counter cast taken.

"In conclusion, we would remark that the time and labor necessary to obtain a die by this process, will on fair trial be found about one-third of that consumed by the usual method, besides having a more perfect cast."

THE HERBST METHOD OF FILLING TEETH.

BY C. F. W. BŒDECKER, D.D.S.

Dr. Bœdecker proposes in this paper to describe the recent improvements in Herbst's system. He points out that the advantages of that system are :—

1st.—Better adaptation for the walls of a cavity than any other system renders possible.

2nd.—The saving of time.

3rd.—Increased facility in some of the most difficult operations (as proximate surfaces of the molars and bicuspids).

4th.—Gold can be perfectly adapted to the thin walls of enamel without danger of fracture.

5th.—The introduction of gold, when done by this method, is much less annoying to the patient, and less laborious to the operator.

The instruments used for this method have been very much modified; they are mostly ordinary smooth burnishers, of which there are three sets: one set of engine points (Herbst), one of hand instruments (Herbst), and one of bent hand instruments (Abbott). Of the old tse of steel engine instruments, only a few are now employed, although sometimes all can be used. The most important of them is the roof-shaped instrument, of which there should be several sizes. These can easily be made out of a broken bur, as follows: The broken instrument is put in the hand-piece of the engine, which, while rotating rapidly, is ground upon an Arkansas stone, or sandpaper. The instrument should lie obliquely on the stone or sandpaper, like a pen in writing, and be quickly moved, drawing it from one side to the other.

The larger instruments are mostly intended for the use of amalgam and tin. The pointed instruments are used for finishing and condensing the edges of proximate fillings. Dr. Bœdecker adds to these three very small, round points, in shape resembling a round cavity bur. They are designed for the use of small proximate cavities in incisors.

Agate, blood-stone, or garnet rotating instruments are better than those made of steel. Gold does not cohere upon them. The surface of a gold filling, which has been condensed by means of an agate or garnet instrument, is very much harder than a filling which has been inserted by steel-points. But a great drawback in the use of stone instruments is their liability to fracture. Herbst exhibited some agate points which had been set in such a manner that only about one thirty-second of an inch of the stone protruded from the steel mandrel, and they would withstand considerable pressure before breaking. These stone points are intended to be used for direct pressure, but for larger surfaces. Herbst has of late employed round agate or garnet beads fastened upon a mandrel with sulphur, and these are intended to be used for lateral pressure, especially in finishing, grinding or labial surfaces. Stone points should not be polished, but roughened upon a corundum stone, while rotating in the engine.

To secure a better union between the different layers of gold when stone instruments have been employed for condensing, the surface of the gold should be roughened by means of a serrated hand plugger, for which purpose Herbst employs a freshly broken excavator.

Dr. Abbott's set is composed of bent burnishers, for places inaccessible to a straight instrument.

In the Herbst method, all complicated cavities (*e.g.*, proximate ones) possessing one, two or three lateral walls, are converted into simple ones (such as cavities involving the grinding surfaces of molars, and having four lateral walls); this is done by using a proper matrix. The matrices are made of steel, German silver, wood or shellac, or the Jack matrices may be employed. For the proximate surfaces of molars and bicuspids, the German silver band matrix should be used. The German silver band matrix can be made as follows: A piece of this metal, No. 32, about one inch in length and as wide as necessary, is bent around the tooth to be filled, so that the metal ends come to the tooth's buccal surface. It is then compressed around the tooth by a pair of specially made pliers. The ring is withdrawn, a little soldering fluid applied united by tin solder. If the tooth to be filled stands alone, the German silver matrix must be strengthened, either by soldering a thin brass wire around it, or by flowing tin solder upon the outside of the matrix wherever strength is required. In soldering, no tin must be allowed to run to the inside of the matrix, especially that part which faces the cavity to be filled, or the tin will touch the rotating instrument, and be incorporated into the filling and impair the cohesion of the separate layers of gold. The matrix must be thoroughly cleansed after soldering, which can best be done with the dental engine, by means of a piece of cotton wound around an old engine bur dipped in moistened pumice. The watch-spring matrices are made out of a piece of watch-spring saw, as follows : A piece of saw half an inch long, as broad as the cavity is deep, is cut off and heated over a spirit flame until it is dark blue. The points of the matrix which are to rest on the cervical edge of the cavity are well rounded off, that in cavities extending under the gum it may be pushed down without injuring either the lingual or buccal portion of the gum. The lateral ends of the matrix must be bent like a clasp around the lingual and buccal portion of the tooth to be filled. When thus prepared, it may be secured by one or two wedges of wood, or ordinary pins, inserted, one from the buccal the other from the lingual side. These wedges should be placed near the gum, between the matrix and the adjoining tooth, firmly pressing the former against the edges of the cavity. In adjusting a matrix in all mesial cavities it must not quite reach the grinding surface of the tooth, or it will obstruct the entrance to the cavity. All the steel matrices may be saved and used again. When two cavities in bicuspids, or molars, face each other, if this plan fails, the matrix, being placed in position, may be secured by filling one of the cavities with cotton or shellac.

For filling in the proximate cavities, when opened from either the labial, the buccal, or the lingual side, a piece of thin steel spring about four to six inches long, and one-eighth to one-fourth of an inch wide may be used, as a matrix. Across one end of this spring a piece of German silver or brass tubing tin is soldered, so that when the spring is in position between the teeth to be filled, the tubing prevents it from being pulled through. In other instances, one end of the steel spring may be fastened into a small piece of shellac, and while this is yet soft and whole may be pressed into the desired position.

This form of matrix is especially applicable for teeth with large crowns and narrow necks, such as lower bicuspids, when the steel spring without the shellac would impinge upon the gum. This steel spring may also be used as a protection to a neighboring tooth during the preparation of the cavity.

In some instances, where the lingual walls of upper incisors to be filled from the labial surface, are not broken away, a piece of German silver, about one inch in length, and wide enough to wholly cover the cavity in the lingual surface of the tooth to be filled, may be used as a matrix. Insert it between the proximate surfaces of the incisors containing the cavity, and bend one end of it so as to cover the cavity in the lingual surface; the other end is bent out of the way, over the labial surface of the adjoining tooth.

If a cavity from the lingual surface of an incisor tooth is to be filled, the matrix must be reversed.

For filling the proximate surfaces of incisors when their lingual walls are much broken, as well as in contour operations a matrix of shellac is employed, made as follows: A piece of shellac, the size of a large walnut, is warmed over a spirit lamp to the consistency of putty, and after applying the rubber dam, this is pressed against the lingual wall, extending a little over the cutting edges of four or six of the teeth. When hard, it is again removed from the mouth, cooled in water, and a small piece of steel spring warmed over the flame of a lamp is inserted in the shellac at the place corresponding to the proximate surfaces of the tooth or teeth to be filled, and, while yet warm, the matrix is replaced in the mouth, and adjusted as required. The piece of steel spring must not quite reach the labial surface of the tooth, or it would obstruct the entrance of the cavity during the introduction of the gold.

The matrices used for contour operations of incisors are made in the same way; but besides the steel matrix of the proximate surfaces, an additional one should be inserted corresponding to the cutting edge of the tooth to be restored.

During the introduction of the filling material, the gold, which (when unannealed) apparently shows no signs of cohesion, working as soft as tin foil, when burnished, becomes somewhat cohesive.

The gold best adapted for this method of filling is very soft cylinders. If foil is used for the first layers of the operation, Nos. 3, 4, and 5 are the best for the purpose. The leaves are cut into halves, and rolled into a rope between the fingers, and cut into pellets of required length; or the sheet may be divided into squares from one-half to one inch, which are formed into pellets. The foil, as well as the cylinders, should never be annealed when used in the first layers of the cavity, except it be a contour operation.

In this starting of a filling, the first layer must be sufficiently large, so that when condensed it will lie securely in the cavity without being supported by an instrument. If too little gold has been put into the first layer, or when a number of too small cylinders are used, and an attempt is made to condense them, the gold will roll about under the instrument, and become too hard to be again adapted to the walls and edges of the cavity. In very large and flat cavities with little undercut, the first layer should be condensed by cotton, as follows: For a large cavity, introduce from 5 to 8 large, soft gold cylinders, without condensing them. A piece of chemically pure cotton, as large as the cavity will hold, is then inserted in the cavity, and it is pressed into every part of the cavity by a rotating burnisher. After the cotton is removed, the gold is further condensed into every depression with agate points.

The Herbst hand instruments, while pressing hard upon the gold, are rotated in the hand about one-half or three-quarters of a turn; but the Abbott instruments are merely moved from side to side. By a rotary motion the gold is much better condensed than by simple pressure. Before the hand instruments are used, they should be rubbed upon a piece of No. 1 sandpaper. After the gold has been thus condensed, the perfect adaptation is obtained by a roof-shaped point, made of steel or agate, in the engine. After the instrument is passed over a piece of sandpaper and is perfectly clean, it is, while rotating, pressed firmly upon the gold, condensing it thoroughly into every depression of the cavity. In condensing, this instrument should be moved round, especially along the edges of the cavity. In using steel points, the engine must not run too fast, and the burnisher, while in motion, must not come in contact with the gold longer than from five to ten seconds, lest the gold be heated to such an extent as to cause discomfort, or even great pain to the patient. The first layer of gold being thoroughly condensed with the roof-shaped instruments, the hand instrument, while rotating, is pressed firmly round the edges and depressions of the cavity. If this makes any deep pits in the gold, then in these places it was not perfectly condensed, and a smaller roof-shaped instrument should be used. All deep pits present in the layer of gold should now be filled up with very small gold cylinders, and thoroughly condensed until the surface of the gold is even. If stone instruments have been employed for condensing, the gold should be roughened by a serrated hand plugger (a freshly broken excavator), or a rotating steel point in the engine, before another layer of gold is added. All the succeeding layers of gold are manipulated in the same manner, except upon larger surfaces, where we can employ the garnet or agate bead with lateral pressure, when heavy foil (Nos. 30 to 60) gives better results. This may be packed upon the other layer of gold in single strips, burnishing every piece down by means of the rotating instrument, while directing the foil by means of a pair of tweezers in the same manner as in packing heavy foil by the electro-magnetic or mechanical mallet. Herbst introduces a rather thick layer of heavy foil first, and then uses the agate or garnet bead; but in these instances, considerable pressure is required to condense the gold perfectly. In some situations, as in buccal walls of molars and bicuspids, when the gold cannot be condensed by direct action of the instrument, the right angle attachment, or an Abbott hand instrument, should be employed.

Tin is used like gold, either as foil or as Robinson's metal. Nos. 4 to 6 foil is cut in half, and made into a rope with the fingers or a napkin, and cut into pieces of the desired length.

Cavities in front teeth, which it is intended to fill with amalgam or oxy-phosphate, may be lined with a thin layer of gold, which will impart to the thin wall of enamel a very life-like appearance. A large and very soft gold cylinder is compressed between the fingers and immersed in a thin solution of gum-copal (about 2 grs. of gum-copal to ½ oz. of sulphuric ether), this prevents the mercury from uniting with the gold, and so discoloring the tooth. The surplus liquid is expressed with the fingers, the ether allowed to evaporate, and then, by means of a piece of cotton, the gold is pressed into the cavity and thoroughly condensed by a rotation instrument in the engine pressed firmly upon the cotton. Upon the removal of the cotton the thin layer of gold is thoroughly and uniformly adapted to every part of the cavity, which may then be filled, either with amalgam or cement, without future discoloration.—*Independent Practitioner.*

SPRINGFIELD, LINN CO., IOWA., 9, 3, 1887.

JOHNSON & LUND,

GENTS:

I have been using your Artificial Teeth for the past twenty years. I find them strong, natural in appearance and possessing all the desired qualities that any one need ask for.

Yours Respectfully,
GUSTAVUS NORTH.

PENNSYLVANIA STATE DENTAL SOCIETY.

The nineteenth annual meeting of the Pennsylvania State Dental Society was held at Glen Summit, Pa., June 26 to 28, 1887. The following officers were elected for the ensuing year: W. F. Fundenberg, president; W. E. Van Arsdel, first vice-president; Louis Jack, second vice-president; Wm. B. Miller, recording secretary; J. R. C. Ward, assistant secretary; P. K. Filbert, corresponding secretary; L. Ashley Faught, treasurer; S. H. Guilford, chairman of executive committee; G. L. Robb, chairman board of censors.

The next annual meeting will be held in Philadelphia, on the first Tuesday in June, 1888.

P. K. FILBERT, *Cor. Sec.*,
Pottsville, Pa.

WISCONSIN STATE DENTAL SOCIETY.

At the annual meeting of the Wisconsin State Dental Society held in Milwaukee, July, 19 to 21, 1887, the following officers were elected: W. F. Lewis, president; C. C. Southwell, first vice-president; F. L. Dolbeare, second vice-president; W. S. Sullivan, secretary; and B. Douglass, treasurer.

W. S. SULLIVAN, *Secretary*,
Madison, Wis.

CENTRAL ILLINOIS DENTAL SOCIETY.

The sixth annual meeting of the Central Illinois Dental Society will be held at Springfield, Ill., October 11 and 12, 1887. A cordial invitation is extended to all to attend this meeting and take part in the discussions.

W. A. JOHNSON, *Secretary*,
Peoria, Ill.

WESTERN DISTRICT DENTAL SOCIETY OF ILLINOIS.

The second annual meeting of the Western District Dental Society of Illinois will convene at Macomb, Ill., on the third Tuesday of October, 1887, and continue two days.

Great preparations are being made for fine clinics, and all dentists are cordially invited to attend.

R. W. BAILEY, D.D.S.,
Macomb, Ill.

Date Due